

# SLV-EX50/EX80S/EX90S

RMT-V312/V312A

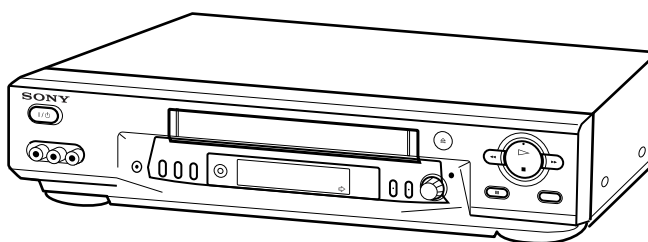
## SERVICE MANUAL

*Argentina Model*

SLV-EX50AR/EX80SAR/  
EX90SAR

*Brazil Model*

SLV-EX50BR/EX80SBR/  
EX90SBR



SLV-EX90S

S MECHANISM

Hi-Fi

Refer to the **SERVICE MANUAL** of **VHS MECHANICAL ADJUSTMENTS VI** for **MECHANICAL ADJUSTMENTS**.  
(9-921-647-11)

\* The abbreviations of EX50/EX80S and EX90S contained in this service manual are indicated when these models are common to all their corresponding models as given below.

| Abbreviated model name  | EX50             | EX80S              | EX90S              |
|-------------------------|------------------|--------------------|--------------------|
| All model names<br>SLV- | EX50AR<br>EX50BR | EX80SAR<br>EX80SBR | EX90SAR<br>EX90SBR |

**VHS** VIDEO CASSETTE RECORDER

**SONY**<sup>®</sup>

## SPECIFICATIONS

### System

#### Format

- VHS N-PAL, NTSC standard  
(SLV-EX50AR/EX80SAR/EX90SAR)
- VHS M-PAL, NTSC standard  
(SLV-EX50BR/EX80SBR/EX90SAR)

#### Video recording system

- Rotary head helical scanning FM system

#### Video heads

- Double azimuth four heads  
(SLV-EX80S/EX90S)
- Double azimuth two heads  
(SLV-EX50)

#### Video signal

- NTSC color, EIA standards

#### Tape speed

- SP: 33.35 mm/s ( $1\frac{3}{8}$  inches/s)
- EP: 11.11 mm/s ( $\frac{7}{16}$  inches/s)
- LP: 16.67 mm/s ( $\frac{11}{16}$  inches/s),  
playback only

#### Maximum recording/playback time

- 8 hrs. in EP mode (with T-160 tape)

#### Fast-forward and rewind time

- Approx. 3 min. (with T-20 tape)

### Tuner Section

#### Channel coverage

- VHF 2 to 13
- UHF 14 to 69
- CATV A-8 to A-1, A to W, W+1 to W+84

#### Antenna

- 75-ohm antenna terminal for VHF/UHF

### Inputs and Outputs

#### SLV-EX80S/EX90S:

#### LINE-1 IN and LINE-2 IN

- VIDEO IN, phono jack (1 each)
- Input signal: 1 Vp-p, 75 ohms,  
unbalanced, sync negative

#### AUDIO IN, phono jack (2 each)

#### Input level: 327 mVrms

#### Input impedance: more than 47 kilohms

#### LINE OUT

#### VIDEO OUT, phono jack (1)

#### Output signal: 1 Vp-p, 75 ohms, unbalanced, sync negative

#### AUDIO OUT, phono jack (2)

#### Standard output: 327 mVrms

#### Load impedance: 47 kilohms

#### Output impedance: less than 10 kilohms

#### SLV-EX50:

#### LINE-1 IN

#### VIDEO IN, phono jack (1)

#### Input signal: 1 Vp-p, 75 ohms, unbalanced, sync negative

#### AUDIO IN, phono jack (1)

#### Input level: 327 mVrms

#### Input impedance: more than 47 kilohms

#### LINE-OUT

#### VIDEO OUT, phono jack (1)

#### Output signal: 1 Vp-p, 75 ohms, unbalanced, sync negative

#### AUDIO OUT, phono jack (1)

#### Standard output: 327 mVrms

#### Load impedance: 47 kilohms

#### Output impedance: less than 10 kilohms

### Timer section

#### Clock

#### Quartz locked

#### Timer indication

#### 12-hour cycle

#### Timer setting

#### 8 programs per month (max.)

### General

#### Power requirements

#### 110-240 V AC, 50/60 Hz

#### (SLV-EX50BR/EX80SBR/EX90SBR)

#### 220 V AC, 50 Hz

#### (SLV-EX50AR/EX80SAR/EX90SAR)

#### Power consumption

#### 14 W (SLV-EX80S/EX90S)

#### 12 W (SLV-EX50)

#### Operating temperature

#### 5°C to 40°C

#### Storage temperature

#### -20°C to 60°C

#### Dimensions

#### Approx. 430 x 97 x 292 mm (w/h/d)

#### including projecting parts and controls

#### Mass

#### Approx. 4.1 kg

#### Power back-up

#### Built-in self-charging capacitor

#### Back-up duration: up to 8 hours at a time

### Supplied accessories

#### Remote commander (1)

#### Size AA(R6) batteries (2)

#### 75-ohm coaxial cable with F-type connectors (1)

#### Audio/video cable (3-phono to 3-phono)

#### (SLV-EX80SBR/EX90SBR) (1)

Design and specifications are subject to change without notice.

## SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.

### SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK  $\triangle$  OR DOTTED LINE WITH MARK  $\triangle$  ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

## TABLE OF CONTENTS

| <u>Section</u>                                                | <u>Title</u> | <u>Page</u> | <u>Section</u>                                                                              | <u>Title</u> | <u>Page</u> |
|---------------------------------------------------------------|--------------|-------------|---------------------------------------------------------------------------------------------|--------------|-------------|
| Feature Difference .....                                      |              | 3           |                                                                                             |              |             |
| SERVICE NOTE .....                                            |              | 5           |                                                                                             |              |             |
| <b>1. GENERAL</b>                                             |              |             | <b>5. INTERFACE, IC PIN FUNCTION DESCRIPTION</b>                                            |              |             |
| Getting Started .....                                         |              | 1-1         | 5-1. System Control-Video Block Interface<br>(MA-402 BOARD IC101) .....                     |              | 5-1         |
| Basic Operations .....                                        |              | 1-5         | 5-2. System Control-Servo Peripheral Circuit Interface<br>(MA-402 BOARD IC101) .....        |              | 5-1         |
| Search Operations .....                                       |              | 1-9         | 5-3. System Control-Mechanism Block Interface<br>(MA-402 BOARD IC101) .....                 |              | 5-2         |
| Additional Operations .....                                   |              | 1-10        | 5-4. System Control-Audio Block Interface<br>(MA-402 BOARD IC101) .....                     |              | 5-3         |
| Additional Information .....                                  |              | 1-13        | 5-5. Servo/System Control,<br>OSD Microprocessor Pin Function<br>(MA-402 BOARD IC101) ..... |              | 5-4         |
| <b>2. DISASSEMBLY</b>                                         |              |             | 5-6. NICAM Processor Pin Function<br>(NK-11 BOARD IC1) .....                                |              | 5-5E        |
| 2-1. Case Front Panel Block Assembly .....                    |              | 2-1         | <b>6. ERROR CODES</b> .....                                                                 |              | 6-1E        |
| 2-2. DM-98, DI-81 Board and FJ-31 Board .....                 |              | 2-1         | <b>7. ADJUSTMENTS</b>                                                                       |              |             |
| 2-3. Rear Panel .....                                         |              | 2-2         | 7-1. Mechanical Adjustments .....                                                           |              | 7-1         |
| 2-4. MA-402 Board .....                                       |              | 2-2         | 7-2. Electrical Adjustments .....                                                           |              | 7-1         |
| 2-5. Mechanism Deck .....                                     |              | 2-3         | 2-1. Pre-Adjustment Preparations .....                                                      |              | 7-1         |
| 2-6. Internal Views .....                                     |              | 2-4         | 2-1-1. Instruments to be Used .....                                                         |              | 7-1         |
| 2-7. Circuit Boards Location .....                            |              | 2-5E        | 2-1-2. Connection .....                                                                     |              | 7-1         |
| <b>3. BLOCK DIAGRAMS</b>                                      |              |             | 2-1-3. Set-up of Adjustment .....                                                           |              | 7-1         |
| 3-1. Overall Block Diagram .....                              |              | 3-1         | 2-1-4. Alingment Tapes .....                                                                |              | 7-1         |
| 3-2. Video Block Diagram .....                                |              | 3-3         | 2-1-5. Specified I/O Level and Impedance .....                                              |              | 7-1         |
| 3-3. Servo/System Control Block Diagram .....                 |              | 3-5         | 2-1-6. Adjusting Sequence .....                                                             |              | 7-2         |
| 3-4. Audio Block Diagram .....                                |              | 3-7         | 2-2. Power Supply Adjustment .....                                                          |              | 7-2         |
| 3-5. Tuner Block Diagram .....                                |              | 3-9         | 2-2-1. Power Supply Check .....                                                             |              | 7-2         |
| 3-6. Mode Control Block Diagram .....                         |              | 3-11        | 2-3. Servo System Adjustment .....                                                          |              | 7-2         |
| 3-7. Power Block Diagram .....                                |              | 3-13        | 2-3-1. RF Switching Position Adjustment .....                                               |              | 7-2         |
| <b>4. PRINTED WIRING BOARDS AND<br/>SCHEMATIC DIAGRAMS</b>    |              |             | 2-4. Audio System Adjustments .....                                                         |              | 7-3         |
| 4-1. Frame Schematic Diagram .....                            |              | 4-3         | 2-4-1. Hi-Fi Audio System Adjustment .....                                                  |              | 7-3         |
| 4-2. Printed Wiring Boards and Schematic Diagrams .....       |              | 4-5         | 1. AF Switching Position Adjustment .....                                                   |              | 7-3         |
| • MA-402 Printed Wiring Board .....                           |              | 4-5         | 2. Frequency Response Check .....                                                           |              | 7-3         |
| • MA-402 (Video, Audio) Schematic Diagram .....               |              | 4-9         | 3. Overall Level Characteristic and<br>Distortion Factor Check .....                        |              | 7-4         |
| • MA-402 (System Control) Schematic Diagram .....             |              | 4-13        | 4. Overall S/N Check .....                                                                  |              | 7-4         |
| • MA-402 (Servo Control) Schematic Diagram .....              |              | 4-17        | 2-4-2. Normal Audio System Adjustment .....                                                 |              | 7-4         |
| • MA-402 (Hi-Fi Audio) Schematic Diagram .....                |              | 4-19        | 1. ACE Head Adjustment .....                                                                |              | 7-4         |
| • MA-402 (Tuner) Schematic Diagram .....                      |              | 4-21        | 2. E-E Output Level Check .....                                                             |              | 7-4         |
| • MA-402 (I/O) Schematic Diagram .....                        |              | 4-23        | 3. Frequency Responce Check .....                                                           |              | 7-4         |
| • MA-402 (Mode Control) Schematic Diagram .....               |              | 4-25        | 4. Overall Level Characteristic and Distortion<br>Factor Check .....                        |              | 7-5         |
| • MA-402 (Power Supply) Schematic Diagram .....               |              | 4-27        | 5. Overall S/N Check .....                                                                  |              | 7-5         |
| • FJ-31 Printed Wiring Boards and<br>Schematic Diagrams ..... |              | 4-31        | 2-5. Tuner System Adjustment .....                                                          |              | 7-5         |
| • DM-98 Printed Wiring Boards and<br>Schematic Diagrams ..... |              | 4-31        | 2-5-1. Separation Adjustment .....                                                          |              | 7-5         |
| • DI-81 Printed Wiring Board and<br>Schematic Diagrams .....  |              | 4-33        | 2-6. Parts Arrangement Diagram for Adjustments .....                                        |              | 7-6E        |
|                                                               |              |             | <b>8. REPAIR PARTS LIST</b>                                                                 |              |             |
|                                                               |              |             | 8-1. Exploded Views .....                                                                   |              | 8-1         |
|                                                               |              |             | 8-1-1. Front Panel and Upper Case Section .....                                             |              | 8-1         |
|                                                               |              |             | 8-1-2. Chassis Section .....                                                                |              | 8-3         |
|                                                               |              |             | 8-1-3. Mechanism Deck Section-1 .....                                                       |              | 8-5         |
|                                                               |              |             | 8-1-4. Mechanism Deck Section-2 .....                                                       |              | 8-6         |
|                                                               |              |             | 8-1-5. Mechanism Deck Section-3 .....                                                       |              | 8-7         |
|                                                               |              |             | 8-2. Electrical Parts List .....                                                            |              | 8-8         |

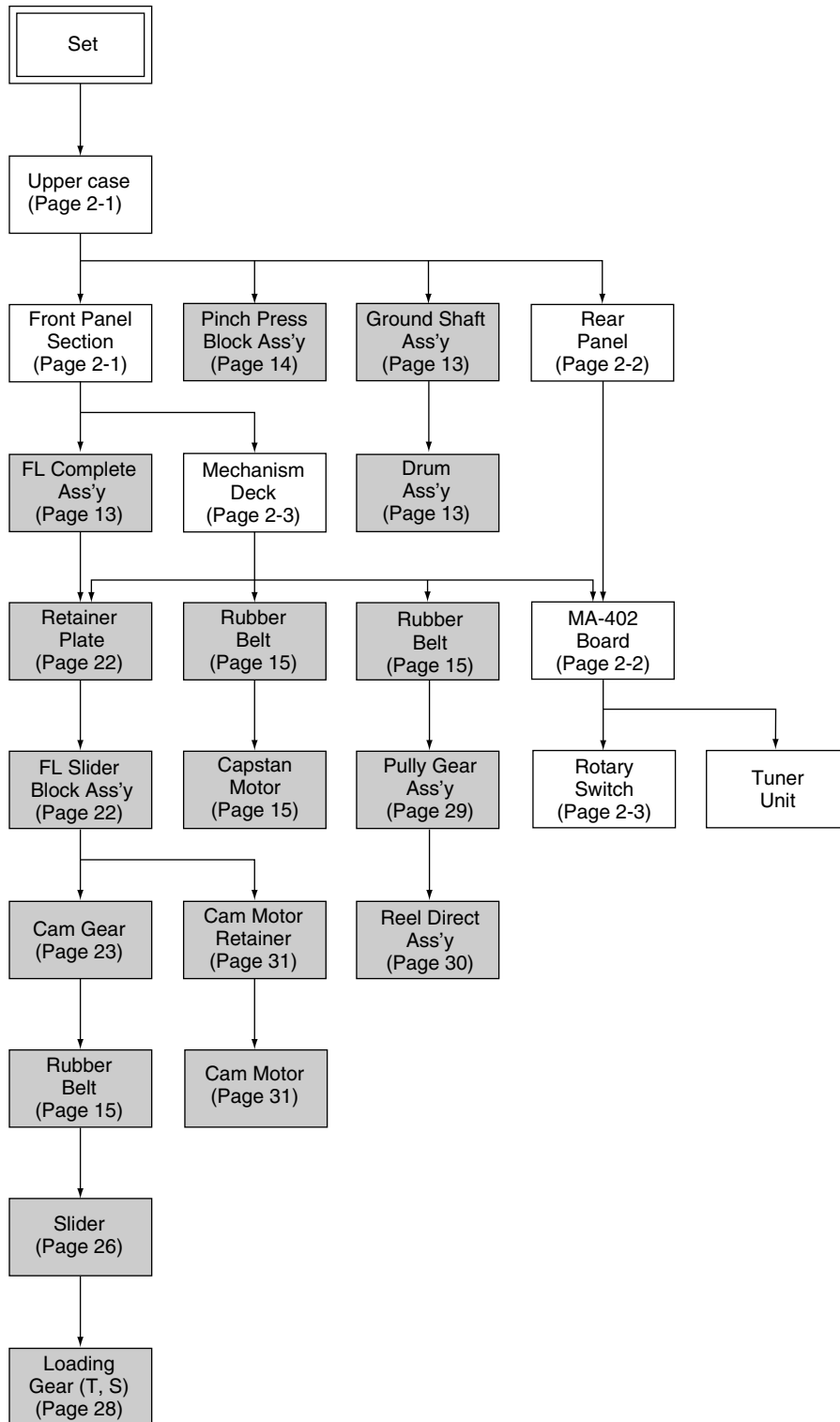
## SERVICE NOTE

### 1. DISASSEMBLY

- This set can be disassembled in the order shown below.

Note: Pages in   indicated pages in the SERVICE MANUAL.

Pages in   indicated pages in the VHS MECHANICAL ADJUSTMENT MANUAL VI.



## SECTION 1 GENERAL

This section is a translated version of Instruction Manual SLV-EX50AR/EX80SAR/EX90SAR model.  
Part number: 3-066-370-11

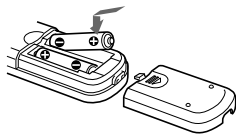
### Step 2

#### Setting up the remote commander

##### Inserting the batteries

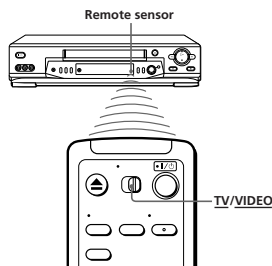
Insert two size AA (R6) batteries by matching the + and - on the batteries to the diagram inside the battery compartment.

Insert the negative (-) end first, then push in and down until the positive (+) end clicks into position.



##### Using the remote commander

You can use this remote commander to operate this VCR and a Sony TV. Buttons on the remote commander marked with a dot (•) can be used to operate your Sony TV. If the TV does not have the symbol near the remote sensor, this remote commander will not operate the TV.



| To operate | Set TV/VIDEO to                                 |
|------------|-------------------------------------------------|
| the VCR    | VIDEO and point at the remote sensor on the VCR |
| a Sony TV  | TV and point at the remote sensor on the TV     |

##### Notes

- With normal use, the batteries should last about three to six months.
- If you do not use the remote commander for an extended period of time, remove the batteries to avoid possible damage from battery leakage.
- Do not use a new battery with an old one.
- Do not use different types of batteries.
- Some buttons may not work with certain Sony TVs.

Getting Started

### Step 3

#### Hookups

##### Selecting the best hookup option

There are many ways in which your VCR can be hooked up. To hook up your VCR so that it works best for you, first scan through the table below. Then use the accompanying diagrams and procedures on the following pages to set up your VCR.

If your TV has audio/video inputs, refer to pages 7 and 8 for audio/video (A/V) hookup. Then follow one of the hookups below.

| If you have                                                       | Use      | Refer to |
|-------------------------------------------------------------------|----------|----------|
| Antenna only, no cable TV                                         | Hookup 1 | Page 9   |
| Cable box with many scrambled channels                            | Hookup 2 | Page 10  |
| No cable box, or cable box with only a few scrambled channels     | Hookup 3 | Page 11  |
| Cable box with only a few scrambled channels, using an A/B switch | Hookup 4 | Page 12  |

After you've completed the connections, follow the instructions for setup.

After you've completed the setup, you're ready to use your VCR. Procedures differ depending on the hookup you used. For an overview, refer to "Quick reference to using the VCR" on the back cover.

##### Before you get started

- Turn off the power to all equipment.
- Do not connect the AC power cords until all of the connections are completed.
- Be sure you make connections firmly. Loose connections may cause picture distortion.
- If your TV doesn't match any of the examples provided, see your nearest Sony dealer or qualified technician.

Getting Started | 5

6 | Getting Started

#### Audio/video (A/V) hookup

Pages 7 and 8

If your TV has audio/video (A/V) input jacks, you will get a better picture and sound if you hook up your VCR using these connections. If your TV doesn't have A/V inputs, see the following pages for antenna or cable hookups.

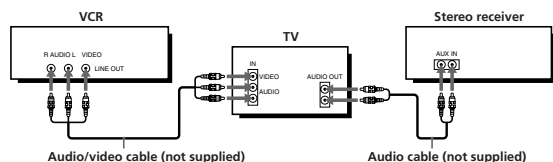
If you're not planning to use your VCR to record programs, you're finished setting up the VCR after you've made the connections shown on pages 7 and 8.

If you want to record off-air or off your cable TV system, complete these connections first, and then go to the following pages for antenna or cable hookups.

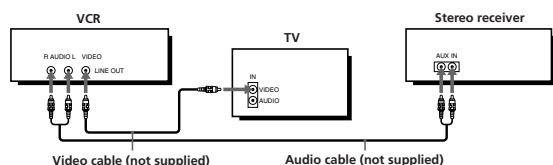
##### For SLV-EX90S AR and EX80S AR

For a true "home theater" experience, you should connect the audio outputs of your VCR or TV to your stereo system.

##### A Use this hookup if your TV has stereo jacks



##### B Use this hookup if your TV doesn't have stereo jacks



##### Note

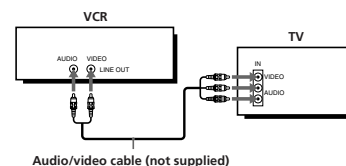
- To play a tape in stereo, you must use the A/V connection.

Getting Started

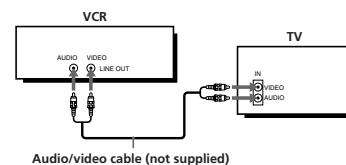
#### Step 3: Hookups (continued)

##### For SLV-EX50 AR

##### A Use this hookup if your TV has stereo jacks



##### B Use this hookup if your TV doesn't have stereo jacks



continued

Getting Started | 7

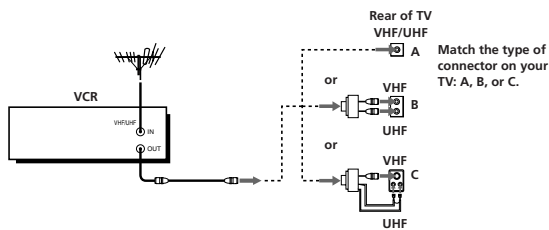
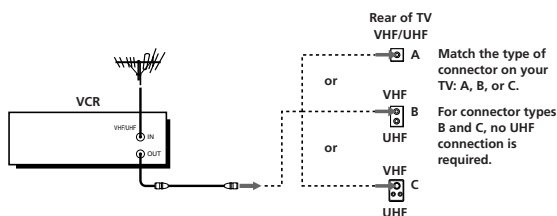
8 | Getting Started

**Antenna hookup**

Make the following connections if you're using an antenna (if you don't have cable TV).

**A Use this hookup if you're using:**

- VHF/UHF antenna (you get channels 2–13 and channels 14 and higher)
- UHF-only antenna (you get channels 14 and higher)
- Separate VHF and UHF antennas

**B Use this hookup if you're using a VHF-only antenna (you get channels 2–13 only)****If you cannot connect your antenna cable to the VCR directly**

If your antenna cable is a flat cable (300-ohm twin lead cable), attach an external antenna connector (not supplied) so you can connect the cable to the VHF/UHF IN connector. If you have separate cables for VHF and UHF antennas, you should use a U/V band mixer (not supplied). For details, see page 60.

continued

Getting Started | 9

**Step 3: Hookups (continued)****Hookup 2****Connecting a cable box with many scrambled channels****Recommended use**

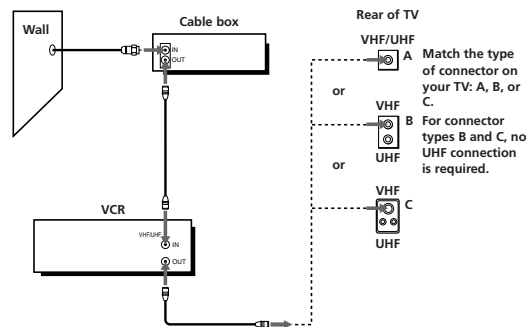
Use this hookup if your cable system scrambles all or most channels.

**What you can do with this hookup**

- Record any channel by selecting the channel on the cable box

**What you can't do**

- Record with the cable box turned off
- Record one channel while watching another channel



10 | Getting Started

**Hookup 3****You have no cable box, or cable box with only a few scrambled channels****Recommended use**

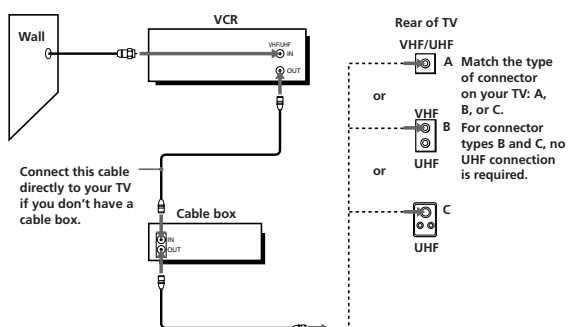
Use this hookup if you do not have a cable box. Also use this hookup if your cable system scrambles only a few channels.

**What you can do with this hookup**

- Record any unscrambled channel by selecting the channel on the VCR

**What you can't do**

- Record scrambled channels that require a cable box



continued

Getting Started | 11

**Step 3: Hookups (continued)****Hookup 4****Connecting a cable box with only a few scrambled channels, using an A/B switch****Recommended use**

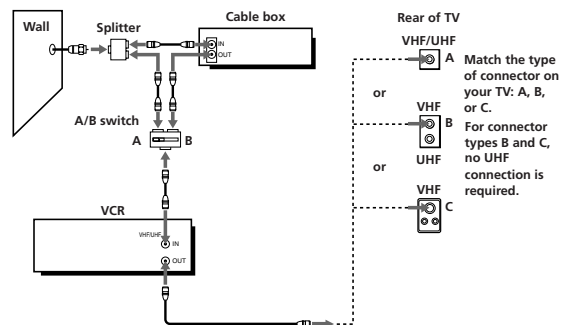
By using an A/B switch (not supplied), this hookup allows you to record both scrambled and unscrambled channels conveniently.

**What you can do with this hookup**

- Record any unscrambled channel by selecting the channel directly on the VCR (the A/B switch is set to A)
- Record any scrambled channel by selecting the channel on the cable box (the A/B switch is set to B)

**What you can't do**

- Record one scrambled channel while watching another channel (the A/B switch is set to B)



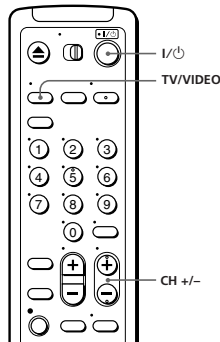
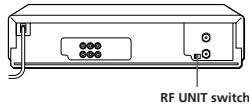
12 | Getting Started

## Step 4

### Setting the RF unit

When connecting the VCR to the TV using only the antenna cable, you must set the RF UNIT switch on the rear of the VCR so that the TV can receive the correct signal from the VCR.

If you made A/V connections (pages 7 and 8), you can skip this step.



Getting Started

- 1** **RF UNIT**  
CH3 CH4  
 Set the RF UNIT switch on the rear of the VCR to CH3 or CH4, whichever channel is not used in your area. If both are used, set the switch to either channel.
- 2** **I/ON**  
 Press I/ON to turn on the VCR.
- 3** **TV/VIDEO**  
 Press TV/VIDEO to display the VIDEO indicator in the VCR's display window.
- 4** **CH**  
 Press CH +/- to display a channel number in the display window. Select an active channel number in your area.

continued

## Step 4: Setting the RF unit (continued)

### 5

Turn on your TV and set it to the channel you selected in step 1 (channel 3 or 4).

The channel you selected in step 4 appears on the TV screen. If the channels change when you press CH +/-, you have made the correct setting.

Whenever you use the VCR, set the TV to the channel selected in step 1.

Getting Started | 13

14 | Getting Started

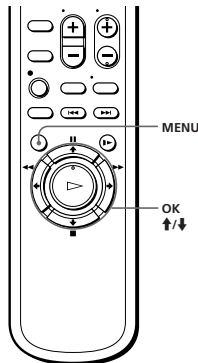
## Step 5

### Selecting a language

You can change the on-screen display language from Spanish to English.

#### Before you start...

- Turn on the VCR and the TV.
- Set the TV to the VCR channel (channel 3 or 4). If your TV is connected to the VCR using A/V connections, set the TV to video input.
- Press TV/VIDEO to display the VIDEO indicator in the VCR's display window.



Getting Started

- 1** **MENU**  
 Press MENU, then press to move the cursor (▶) to SELECCION DEL IDIOMA and press OK.
- 2** Press to select the desired language, then press OK.

#### Note

- The menu disappears automatically if you don't proceed for more than a few minutes.

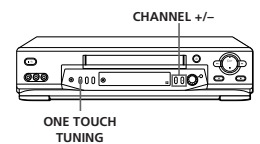
Getting Started | 15

## Step 6

### Presetting channels

First, we recommend that you preset the receivable channels in your area using the One Touch Tuning function or SINTONIA AUTOMATICA in the AJUSTE DE SINTONIA menu. Then, if some channels cannot be preset automatically, set them manually. If there are any unwanted channels among the preset ones, you can disable the channels.

#### Presetting all receivable channels using the One Touch Tuning function



Press and hold ONE TOUCH TUNING on the VCR for more than three seconds.

The VCR starts presetting the channel.



The WAIT indicator goes off when all receivable channels are preset.

#### To check if the channels are preset correctly

Set the TV to the video channel and press CHANNEL +/- on the VCR. If the TV screen changes to a different program each time you press CHANNEL +/-, the channels are preset correctly.

#### Tip

- To stop the One Touch Tuning function, press ONE TOUCH TUNING or STOP on the VCR during the setting.

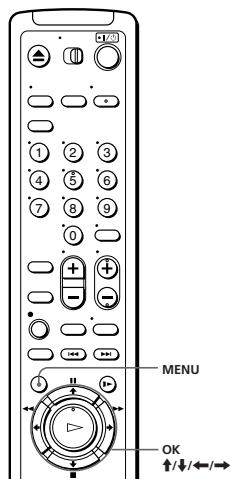
16 | Getting Started

## Presetting all receivable channels automatically

If you have preset the channels using the One Touch Tuning function, skip this procedure.

### Before you start...

- Turn on the VCR and the TV.
- Set the TV to the VCR channel (channel 3 or 4). If your TV is connected to the VCR using A/V connections, set the TV to video input.
- Press TV/VIDEO to display the VIDEO indicator in the VCR's display window.



Getting Started

- 1 Press MENU, then press  $\uparrow/\downarrow$  to move the cursor (►) to AJUSTE DE SINTONIA and press OK.



|                     |             |
|---------------------|-------------|
| AJUSTE DE SINTONIA  | CAN 1       |
| ANTENA / CABLE      | ANT • CABLE |
| SINTONIA AUTOMATICA | •• -        |
| SINT. MANUAL        | •• -        |
| AFT                 | •SI NO      |
| SINTONIA FINA       |             |
| SELECCIONAR         | : [••]      |
| AJUSTAR             | : [••]      |

continued

## Step 6: Presetting channels (continued)

- 2 Press  $\uparrow/\downarrow$  to select ANTENA/CABLE.



- 3 To preset cable TV channels:  
Press  $\leftarrow/\rightarrow$  to set ANTENA/CABLE to CABLE.



- To preset VHF and UHF channels:  
Press  $\leftarrow/\rightarrow$  to set ANTENA/CABLE to ANT.



|                     |             |
|---------------------|-------------|
| AJUSTE DE SINTONIA  | CAN 1       |
| ANTENA / CABLE      | ANT • CABLE |
| SINTONIA AUTOMATICA | •• -        |
| SINT. MANUAL        | •• -        |
| AFT                 | •SI NO      |
| SINTONIA FINA       |             |
| SELECCIONAR         | : [••]      |
| AJUSTAR             | : [••]      |

|                     |             |
|---------------------|-------------|
| AJUSTE DE SINTONIA  | CAN 1       |
| ANTENA / CABLE      | ANT • CABLE |
| SINTONIA AUTOMATICA | •• -        |
| SINT. MANUAL        | •• -        |
| AFT                 | •SI NO      |
| SINTONIA FINA       |             |
| SELECCIONAR         | : [••]      |
| AJUSTAR             | : [••]      |

- 4 Press  $\uparrow/\downarrow$  to move the cursor (►) to SINTONIA AUTOMATICA, then press OK.  
All receivable channels are preset in numerical sequence. When no more receivable channels can be found, presetting stops and the picture from the lowest numbered channel is displayed on the TV screen.



|                     |             |
|---------------------|-------------|
| AJUSTE DE SINTONIA  | CAN 1       |
| ANTENA / CABLE      | ANT • CABLE |
| SINTONIA AUTOMATICA | •• -        |
| SINT. MANUAL        | •• -        |
| AFT                 | •SI NO      |
| SINTONIA FINA       |             |
| SELECCIONAR         | : [••]      |
| AJUSTAR             | : [••]      |

### Note

- The menu disappears automatically if you don't proceed for more than a few minutes.

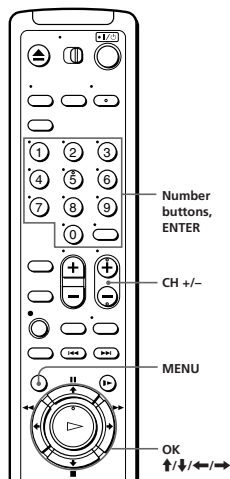
Getting Started | 17

18 | Getting Started

## Presetting/disabling channels manually

### Before you start...

- Turn on the VCR and the TV.
- Set the TV to the VCR channel (channel 3 or 4). If your TV is connected to the VCR using A/V connections, set the TV to video input.
- Press TV/VIDEO to display the VIDEO indicator in the VCR's display window.



Getting Started

- 1 Press MENU, then press  $\uparrow/\downarrow$  to move the cursor (►) to AJUSTE DE SINTONIA and press OK.



|                     |             |
|---------------------|-------------|
| AJUSTE DE SINTONIA  | CAN 1       |
| ANTENA / CABLE      | ANT • CABLE |
| SINTONIA AUTOMATICA | •• -        |
| SINT. MANUAL        | •• -        |
| AFT                 | •SI NO      |
| SINTONIA FINA       |             |
| SELECCIONAR         | : [••]      |
| AJUSTAR             | : [••]      |

continued

## Step 6: Presetting channels (continued)

- 2 To preset a channel:  
1 Press the number buttons to enter the channel number, then press ENTER.  
2 Press  $\leftarrow/\rightarrow$  to set SINT. MANUAL to +.



- To disable a channel:  
1 Press CH +/- to select the channel number.  
2 Press  $\leftarrow/\rightarrow$  to set SINT. MANUAL to -.



### Channel to be preset

|                     |             |
|---------------------|-------------|
| AJUSTE DE SINTONIA  | CAN 1       |
| ANTENA / CABLE      | ANT • CABLE |
| SINTONIA AUTOMATICA | •• -        |
| SINT. MANUAL        | •• -        |
| AFT                 | •SI NO      |
| SINTONIA FINA       |             |
| SELECCIONAR         | : [••]      |
| AJUSTAR             | : [••]      |

### Channel to be disabled

|                     |             |
|---------------------|-------------|
| AJUSTE DE SINTONIA  | CAN 1       |
| ANTENA / CABLE      | ANT • CABLE |
| SINTONIA AUTOMATICA | •• -        |
| SINT. MANUAL        | •• -        |
| AFT                 | •SI NO      |
| SINTONIA FINA       |             |
| SELECCIONAR         | : [••]      |
| AJUSTAR             | : [••]      |

- 3 Repeat step 2 to preset or disable channels as required, then press OK.



### Note

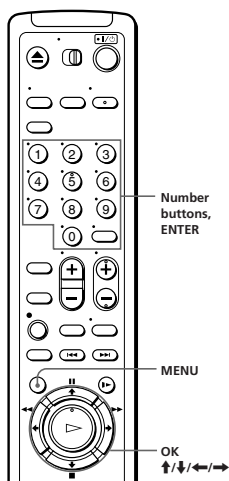
- The menu disappears automatically if you don't proceed for more than a few minutes.

Getting Started | 19

20 | Getting Started

### If the picture is not clear

Normally, the Auto Fine Tuning (AFT) function automatically tunes in channels clearly. If, however, the picture of a channel is not clear, you can also use the manual tuning function.



Getting Started

- Press MENU, then press  $\uparrow/\downarrow$  to move the cursor ( $\blacktriangleright$ ) to AJUSTE DE SINTONIA and press OK.

|                     |             |
|---------------------|-------------|
| AJUSTE DE SINTONIA  | CAN 1       |
| ANTENA / CABLE      | ANT + CABLE |
| SINTONIA AUTOMATICA | SI -        |
| SINT. MANUAL        | SI -        |
| AFT                 | SI -        |
| SINTONIA FINA       | SI -        |
| SELECCIONAR         | [•••]       |
| AJUSTAR             | [•••]       |

continued

### Step 6: Presetting channels (continued)

- Press the number buttons to select the channel you want to fine-tune, then press ENTER.
- Press  $\uparrow/\downarrow$  to move the cursor ( $\blacktriangleright$ ) to SINTONIA FINA. The fine tuning meter appears.
- Press  $\leftarrow/\rightarrow$  to adjust to a clearer picture, then press OK. Note that the AFT setting switches to NO.

|                     |             |
|---------------------|-------------|
| AJUSTE DE SINTONIA  | CAN 3       |
| ANTENA / CABLE      | ANT + CABLE |
| SINTONIA AUTOMATICA | SI -        |
| SINT. MANUAL        | SI -        |
| AFT                 | SI -        |
| SINTONIA FINA       | SI -        |
| SELECCIONAR         | [•••]       |
| AJUSTAR             | [•••]       |

|                     |             |
|---------------------|-------------|
| AJUSTE DE SINTONIA  | CAN 14      |
| ANTENA / CABLE      | ANT + CABLE |
| SINTONIA AUTOMATICA | SI -        |
| SINT. MANUAL        | SI -        |
| AFT                 | SI -        |
| SINTONIA FINA       | SI -        |
| SELECCIONAR         | [•••]       |
| AJUSTAR             | [•••]       |

|                     |             |
|---------------------|-------------|
| AJUSTE DE SINTONIA  | CAN 14      |
| ANTENA / CABLE      | ANT + CABLE |
| SINTONIA AUTOMATICA | SI -        |
| SINT. MANUAL        | SI -        |
| AFT                 | SI -        |
| SINTONIA FINA       | SI -        |
| SELECCIONAR         | [•••]       |
| AJUSTAR             | [•••]       |

#### Tip

- To select the channel in step 2 above, you can also use the CH +/- buttons. In this case, you don't need to press ENTER.

#### Notes

- The menu disappears automatically if you don't proceed for more than a few minutes.
- When adjusting FINE TUNING, the menu may become difficult to read due to interference from the picture being received.

Getting Started | 21

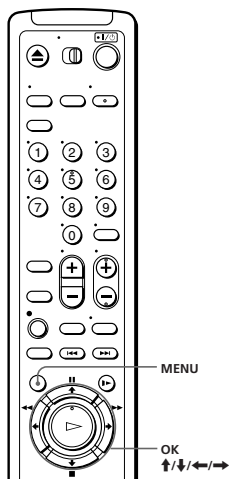
22 | Getting Started

## Step 7 Setting the clock

You must set the time and date on the VCR to be able to use the timer recording features properly.

#### Before you start...

- Turn on the VCR and the TV.
- Set the TV to the VCR channel (channel 3 or 4). If your TV is connected to the VCR using A/V connections, set the TV to video input.
- Press TV/VIDEO to display the VIDEO indicator in the VCR's display window.



Getting Started

- Press MENU, then press  $\uparrow/\downarrow$  to move the cursor ( $\blacktriangleright$ ) to AJUSTE DEL RELOJ and press OK.

|                  |                    |
|------------------|--------------------|
| AJUSTE DEL RELOJ | 1. 2001 LUN 12:00W |
| SELECCIONAR      | [•••]              |
| AJUSTAR          | [•••]              |
| FIN              | [OK]               |

- Press  $\uparrow/\downarrow$  to set the date. The day of the week is set automatically.

|                  |                    |
|------------------|--------------------|
| AJUSTE DEL RELOJ | 1. 2001 DOM 12:00W |
| SELECCIONAR      | [•••]              |
| AJUSTAR          | [•••]              |
| FIN              | [OK]               |

continued

Getting Started | 23

### Step 7: Setting the clock (continued)

- Press  $\rightarrow$  to select the month and press  $\uparrow/\downarrow$  to set the month.
- Set the year, hour, and minute in sequence, using  $\rightarrow$  to select the item to be set, and  $\uparrow/\downarrow$  to select the digits. The day of the week is set automatically.
- Press OK to start the clock.

|                  |                        |
|------------------|------------------------|
| AJUSTE DEL RELOJ | 28. 9. 2001 VIE 12:00W |
| SELECCIONAR      | [•••]                  |
| AJUSTAR          | [•••]                  |
| FIN              | [OK]                   |

|                  |                        |
|------------------|------------------------|
| AJUSTE DEL RELOJ | 28. 9. 2001 VIE 12:00W |
| SELECCIONAR      | [•••]                  |
| AJUSTAR          | [•••]                  |
| FIN              | [OK]                   |

#### Tip

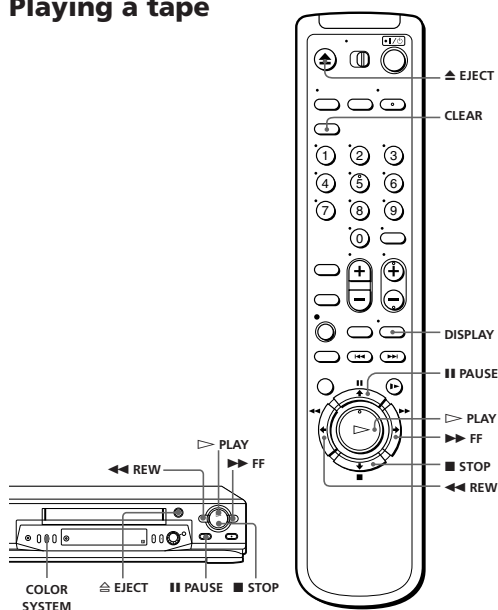
- To change the digits during the setting, press  $\leftarrow$  to return to the item to be changed, and select the digits by pressing  $\uparrow/\downarrow$ .

#### Note

- The menu disappears automatically if you don't proceed for more than a few minutes.

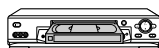
24 | Getting Started

## Playing a tape



**1** Turn on your TV and set it to the video channel.

**2** Insert a tape.  
The VCR turns on and starts playing automatically if you insert a tape with its safety tab removed.



continued

## Playing a tape (continued)

3



Press ▷ PLAY.

When the tape reaches the end, it will rewind automatically.

### Additional tasks

| To                      | Press             |
|-------------------------|-------------------|
| Stop play               | ■ STOP            |
| Pause play              | ⏸ PAUSE           |
| Resume play after pause | ⏸ PAUSE or ▷ PLAY |
| Fast-forward the tape   | ⏭ FF during stop  |
| Rewind the tape         | ⏮ REW during stop |
| Eject the tape          | ⏏ EJECT           |

### To set the color system

If streaks appear during playback, press COLOR SYSTEM on the VCR to conform to the system that the tape was recorded in. (Normally, the color system is correctly set whenever the tape is inserted.)

| If your tape was recorded in | Press COLOR SYSTEM until the indicator below appears in the display window. |
|------------------------------|-----------------------------------------------------------------------------|
| PAL-N                        | PAL                                                                         |
| NTSC                         | NTSC                                                                        |

### To play an NTSC-recorded tape

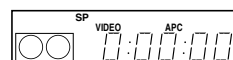
Set NTSC PB in the AJUSTES ESPECIALES according to the color system of your TV. For details, see page 56.

| If your TV is | Set NTSC PB to |
|---------------|----------------|
| PAL-N         | ON PAL-N TV    |
| NTSC 3.58     | NTSC 3.58      |

\* If you are using a multi-system TV, set the NTSC PB in the AJUSTES ESPECIALES to NTSC 3.58 for better picture quality.

### To use the time counter

Press CLEAR at the point on the tape that you want to find later. The counter in the display window resets to "0:00:00." Search for the point afterwards by referring to the counter.

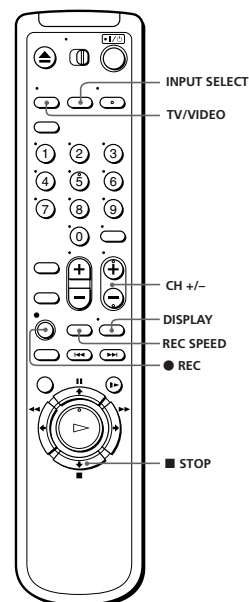


To display the counter on the TV screen, press DISPLAY. Press DISPLAY again and the counter will disappear from the TV screen.

#### Notes

- The counter resets to "0:00:00" whenever a tape is reinserted.
- The counter stops counting when it comes to a portion with no recording.
- If a tape has portions recorded in both PAL-N and NTSC systems, the time counter reading will not be correct. This is due to the difference between the counting cycles of the two color systems.
- Depending on your TV, the following may occur while playing an NTSC-recorded tape:
  - the picture is black and white
  - the picture shakes
  - no picture appears on the TV screen
  - black streaks appear horizontally on the TV screen
  - the color density increases or decreases.
- Tapes recorded in the LP mode of other NTSC system VCRs can be played back on this VCR but the picture quality cannot be guaranteed.
- While setting the menu on the TV screen, you cannot use the ▷ PLAY, ⏸ PAUSE, ⏭ FF, ⏮ REW, or ■ STOP button.

## Recording TV programs



1

Turn on your TV and set it to the video channel.  
To record from a cable box, turn it on.

2

Insert a tape with its safety tab in place.

**3** Press CH +/- to select the channel you want to record.



**4** Press REC SPEED to select the tape speed. (SP or LP for the PAL-N color system, and SP or EP for the NTSC color system)  
LP (Long Play) provides recording time twice as long as SP (Standard Play). EP (Extended Play) provides recording time three times as long as SP. However, SP produces better picture and audio quality.



**5** Press REC to start recording.  
The recording indicator lights up red in the display window.

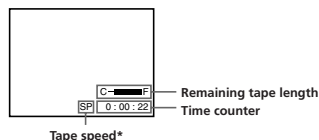
Recording indicator 

#### To stop recording

Press STOP.

#### To check the remaining tape length

Press DISPLAY. The white bar indicates the approximate length of tape remaining.



\* Appears for a few seconds when the ON SCREEN DISPLAY is pressed and when the mode is changed.

continued

### Recording TV programs (continued)

#### To watch another TV program while recording

- 1 Press TV/VIDEO to turn off the VIDEO indicator in the display window.
- 2 If the TV is connected to the VCR using an audio/video cable, set the TV to TV input. If the TV is connected to the VCR using only the antenna cable, skip this step.
- 3 Select another channel on the TV.

#### To save a recording

To prevent accidental erasure, break off the safety tab as illustrated. To record on the tape again, cover the tab hole with adhesive tape.



#### Tips

- To select a channel, you can use the number buttons on the remote commander. Enter the channel number, then press ENTER.
- You can select a video source from the LINE-1 IN or LINE-2 IN (SLV-EX90S AR/EX80S AR only) jacks using the INPUT SELECT or CH +/- buttons.
- The display appears on the TV screen indicating information about the tape, but the information won't be recorded on the tape.
- If you don't want to watch TV while recording, you can turn off the TV. When using a cable box, make sure to leave it on.
- You can have the VCR stop recording automatically after starting at a specified time. For details, see "Setting the recording duration time" on page 47.

#### Notes

- The display doesn't appear during still (pause) mode or slow-motion playback.
- If a tape has portions recorded in both PAL-N and NTSC systems, the time counter reading will not be correct. This discrepancy is due to the difference between the counting cycles of the two color systems.
- When you insert a non-standard commercially available tape, the remaining time may not be correct.
- It may take up to one minute for the VCR to calculate and display the remaining tape length after you press DISPLAY.

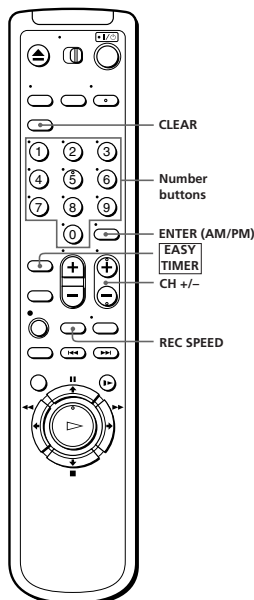
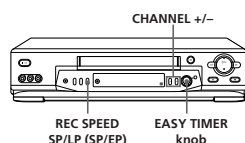
## Recording TV programs using the Easy Timer function

The Easy Timer function allows you to make a timer recording of a program without turning on your TV. Set the recording timer to record only one program that will be broadcast within the next 24 hours using the EASY TIMER knob. If the VCR clock has not been set, you can also set the clock before setting the timer recording.

### Setting the Easy Timer

#### Before you start...

- When using a cable box, turn it on.
- Insert a tape with its safety tab in place. Make sure the tape is longer than the total recording time.



**1** Push the EASY TIMER knob. The START indicator appears in the display window.  
If the clock has not been set, "--:--" appears. Go to step 2 in "Setting or changing the Easy Clock" on page 33.



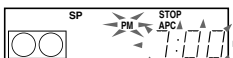
continued

### Recording TV programs using the Easy Timer function (continued)

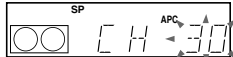
**2** Set the recording start time by turning the EASY TIMER knob clockwise or counterclockwise to increase or decrease the time by 15 minutes.  
Press CHANNEL +/- to increase or decrease the time by a minute.  
Press ENTER (AM/PM) to change AM and PM.



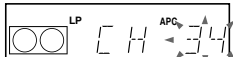
**3** Push the EASY TIMER knob to confirm the start time setting. The STOP indicator appears.



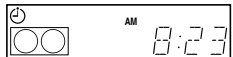
**4** Set the recording stop time in the same way as in step 2, then push the EASY TIMER knob.  
A channel number flashes.



**5** Turn the EASY TIMER knob clockwise or counterclockwise to select the channel you want to record.  
To select the tape speed, press REC SPEED.  
(SP/EP)

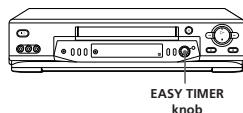


**6** Push the EASY TIMER knob to confirm the setting. The indicator appears in the display window and the VCR stands by for recording.

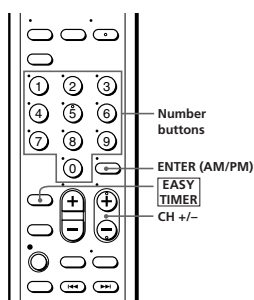


## Setting or changing the Easy Clock

When “--:--” is displayed in the VCR’s display window, the VCR clock has not been set. You need to set the clock using the Easy Clock function before setting the timer. You can also change the current time using the Easy Clock function.



EASY TIMER knob



- 1 **EASY TIMER**
  - When “--:--” is displayed in the display window, push the EASY TIMER knob.
  - To change the clock setting, push and hold the EASY TIMER knob on the VCR for more than three seconds. The CLOCK indicator and the current clock setting appear in the display window.

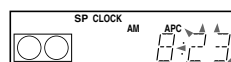


- 2 **EASY TIMER**

Set the current time using the EASY TIMER knob.

  - 1 Turn the EASY TIMER knob clockwise or counterclockwise to enter the current hour.
  - 2 Push the EASY TIMER knob to confirm the hour setting.
  - 3 Turn the EASY TIMER knob to increase or decrease the minutes setting by a minute.

Press ENTER (AM/PM) to change AM and PM.



continued

Basic Operations 33

## Recording TV programs using the Easy Timer function (continued)

- 3 **EASY TIMER**

Push the EASY TIMER knob to finish setting the clock. The VCR enters the timer recording setting mode.

To continue the Easy Timer setting, go to step 2 in “Setting the Easy Timer” on page 31.

To quit the Easy Timer setting mode without changing any settings, push the EASY TIMER knob repeatedly until the ⌚ indicator appears in the display window.



### To set the timer and clock setting using the remote commander

You can also use the remote commander to set the Easy Timer and Easy Clock. The operations on the VCR and the remote commander correspond as follows:

| To                                                        | Do this on the VCR                                | Do this on the remote commander |
|-----------------------------------------------------------|---------------------------------------------------|---------------------------------|
| Confirm the setting and go to the next setting            | Push the EASY TIMER knob                          | Press <b>[EASY TIMER]</b>       |
| Change the time by 15 minutes (in START/STOP mode)        | Turn the EASY TIMER knob or hold CHANNEL +/- down | Hold CH +/- down                |
| Change the time by one minute (in START/STOP mode)        | Press CHANNEL +/-                                 | Press CH +/-                    |
| Select the channel                                        | Turn the EASY TIMER knob or press CHANNEL +/-     | Press CH +/- or INPUT SELECT    |
| Change the hour/minute by one hour/minute (in CLOCK mode) | Turn the EASY TIMER knob or press CHANNEL +/-     | Press CH +/-                    |

You can also use the number buttons to set the clock, start and stop times, and the channel you want to record. Just press the number buttons to enter the hours and minutes. For example:

- To set the clock to “8:20”, press 0, 8, **[EASY TIMER]**, 2, 0 and **[EASY TIMER]** in sequence.
- To set the start or stop time to “8:20”, press 0, 8, 2, 0 and **[EASY TIMER]** in sequence.

If you make a mistake, re-enter the correct digits before pressing **[EASY TIMER]**.

34 Basic Operations

### To stop recording

To stop the VCR while recording, press **[STOP]**.

### To check or change the timer setting

Push the EASY TIMER knob repeatedly until the setting you want to check or change flashes. Then re-enter the new setting, if necessary. If you do not want to change any of the settings, push the EASY TIMER knob repeatedly until the ⌚ indicator appears in the display window.

You can also change the timer setting using the PROGRAM./VERIF. menu. For details, see page 50.

### To cancel the timer setting

To cancel the Easy Timer setting while entering a setting, press CLEAR on the remote commander or press CHANNEL + and - on the VCR at the same time.

### To use the VCR after setting the timer

To use the VCR before a timer recording begins, just press I/⌚. The ⌚ indicator turns off and the VCR switches on. Remember to press I/⌚ to reset the VCR to the timer recording standby mode after using the VCR.

You can also do the following tasks while the VCR is recording:

- Reset the counter.
- Display tape information on the TV screen.
- Check the timer settings.
- Watch another TV program.

### To watch the recorded program right after recording with the Easy Timer

The SEARCH MODE indicator starts flashing when the VCR finishes the Easy Timer recording. To watch the recorded program, push the EASY TIMER knob. The VCR turns on, starts searching, then automatically starts playback from the beginning of the recording. For details, see page 40.

continued

Basic Operations 35

## Recording TV programs using the Easy Timer function (continued)

### Tips

- To record from a source connected to the LINE-1 IN or LINE-2 IN (SLV-EX90S AR/EX80S AR only) jacks, press INPUT SELECT or CH +/- or turn the EASY TIMER knob to display “L1” or “L2” (SLV-EX90S AR/EX80S AR only) in the display window.
- To record NTSC signals, set the tape speed to SP or EP. To set to the EP mode, display “LP” in the display window.

### Notes

- You cannot set the Easy Timer if eight programs have already been set.
- You can set the timer for only one program using the Easy Timer function. If you want to set the timer for other programs, use the PROGRAM./VERIF. menu. For details, see page 37.
- You cannot set the date using the Easy Timer function. Set the date using the AJUSTE DEL RELOJ menu if you want to set the timer with the menu. For details, see page 23.
- The ⌚ indicator flashes in the display window when you complete the setting with no tape inserted.

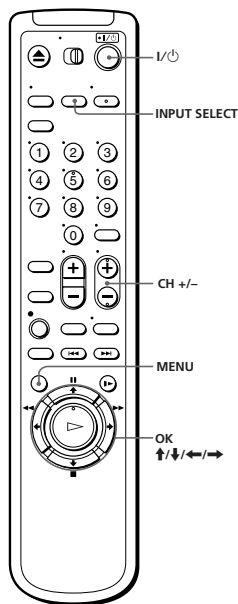
36 Basic Operations

## Setting the timer manually

You can preset up to eight programs at a time.

### Before you start...

- Check that the VCR clock is set to the correct time.
- Insert a tape with its safety tab in place. Make sure the tape is longer than the total recording time.
- Turn on your TV and set it to the video channel.



- 1 Press MENU and select PROGRAM./VERIF., then press OK.



| PROGRAM / VERIF. | FECHA | INICIO | FIN | CANAL |
|------------------|-------|--------|-----|-------|
| 1                | ---   | ---    | --- | ---   |
| 2                | ---   | ---    | --- | ---   |
| 3                | ---   | ---    | --- | ---   |
| 4                | ---   | ---    | --- | ---   |
| 5                | ---   | ---    | --- | ---   |
| 6                | ---   | ---    | --- | ---   |
| 7                | ---   | ---    | --- | ---   |
| 8                | ---   | ---    | --- | ---   |
| 9                | ---   | ---    | --- | ---   |
| 0                | ---   | ---    | --- | ---   |

continued

Basic Operations 37

## Setting the timer manually (continued)

- 2 Set the date, start and stop times, channel number, and tape speed:



- 1 Press → to select each item in turn.
- 2 Press ↑/↓ to set each item.

To correct a setting, press ← to return to that setting and reset it.

To record the same program every day or the same day every week, press ↓ while the date is flashing. For details, see "Daily/weekly recording" on page 39.

To record from a source connected to the LINE-1 IN or LINE-2 IN (SLV-EX90S AR/EX80S AR only) jacks, press INPUT SELECT or CH +/- to display "L1" or "L2" (SLV-EX90S AR/EX80S AR only) in the "CANAL" position.

| PROGRAM / VERIF. | FECHA | INICIO | FIN | CANAL |
|------------------|-------|--------|-----|-------|
| 1                | ---   | ---    | --- | ---   |
| 2                | ---   | ---    | --- | ---   |
| 3                | ---   | ---    | --- | ---   |
| 4                | ---   | ---    | --- | ---   |
| 5                | ---   | ---    | --- | ---   |
| 6                | ---   | ---    | --- | ---   |
| 7                | ---   | ---    | --- | ---   |
| 8                | ---   | ---    | --- | ---   |
| 9                | ---   | ---    | --- | ---   |
| 0                | ---   | ---    | --- | ---   |



- 3 Press → to confirm the setting.



The cursor (▶) appears at the beginning of the line. To enter another setting, move the cursor to the next line and repeat step 2.

- 4 Press OK.



- 5 Press I/⏻ to turn off the VCR.



Press I/⏻ to turn off the VCR.

The ⏻ indicator appears in the display window and the VCR stands by for recording.

To record from other equipment, leave the connected equipment switched on.

### To stop recording

To stop the VCR while recording, press ■ STOP.

## Daily/weekly recording

In step 2 above, press ↓ to select the recording pattern. Each time you press ↓, the indication changes as shown below. Press ↑ to change the indication in reverse order.

the current date → DOM-SAB (Sunday to Saturday) → LUN-SAB (Monday to Saturday) → LUN-VIE (Monday to Friday) → TODOS SAB (every Saturday) → ..... → TODOS LUN (every Monday) → TODOS DOM (every Sunday) → 1 month later → (dates count down) → the current date

### Tips

- To set the channel, you can also use the CH +/- or number buttons.
- To set the tape speed, you can also use the REC SPEED button.
- To record NTSC signals, set the tape speed to SP or EP. To set to the EP mode, display "LP" in the tape speed position.

### Note

- The ⏻ indicator flashes in the display window when you press I/⏻ with no tape inserted.

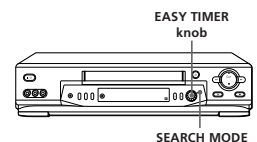
Basic Operations

Basic Operations 39

## Search Operations

## Searching for the beginning of an Easy Timer recorded program

If you record a program using the Easy Timer function, you can easily find the beginning of the recording with the SEARCH MODE function. The SEARCH MODE indicator flashes when the VCR finishes making an Easy Timer recording.



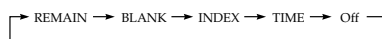
Push the EASY TIMER knob.

The VCR turns on, rewinds to the beginning of the recorded program and starts playback automatically. The SEARCH MODE indicator turns off.

### Tip

- You can start the SEARCH MODE function after the flashing of the SEARCH MODE indicator has been stopped. The flashing stops when you turn on the VCR and press the SEARCH MODE button (Do not press any button at this point, otherwise this SEARCH MODE function will be canceled). To start the SEARCH MODE function, press the SEARCH MODE button repeatedly until the SEARCH MODE indicator flashes. Push the EASY TIMER knob. The VCR rewinds and starts playback automatically.

If you continue to press the SEARCH MODE button while the SEARCH MODE indicator is flashing, you can enter other search operations (For details, see the following pages). Each press of the SEARCH MODE button changes the search operations as follows:



### Note

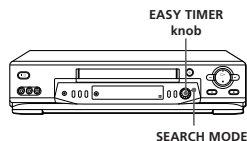
- This SEARCH MODE function will be canceled (the SEARCH MODE indicator turns off) if:
  - The VCR starts recording other programs.
  - You press the ▷ PLAY, ►► FF, ◀◀ REW or ⏻ EJECT button while the VCR is on.

38 Basic Operations

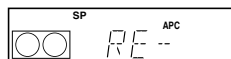
40 Search Operations

## Searching for the current position on a tape

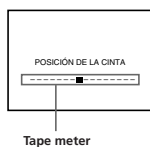
This feature enables you to find the current position on a tape as well as the remaining time of the tape.



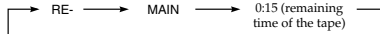
- 1 Press SEARCH MODE repeatedly until the REMAIN indicator appears in the display window as shown on the right. The SEARCH MODE indicator lights up.



- 2 Push the EASY TIMER knob to display the tape meter on the TV screen. The SEARCH MODE indicator turns off. A cursor (■) indicates the current position on the tape.



"REMAIN" and the remaining time of the tape appear in the display window in the following order:



**To stop the Search function**  
Press ■ STOP.

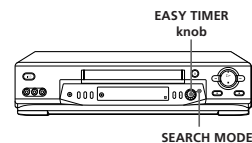
### Notes

- To display the remaining time correctly you may have to select the SELEC DE CINTA in the AJUSTES ESPECIALES according to the type of the tape that you are using. For details, see page 56.
- In step 2, the VCR automatically rewinds and fast-forwards the tape only if you press the SEARCH MODE button right after you insert a tape. This is so that the VCR can measure the current position on the tape.
- You cannot use this function during any recording mode.

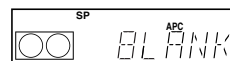
Search Operations | 41

## Searching using the Blank Search function

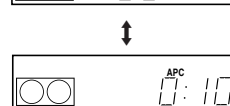
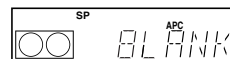
This feature enables you to find a blank section on your tape.



- 1 Press SEARCH MODE repeatedly until the BLANK indicator appears in the display window. The SEARCH MODE indicator lights up.



- 2 Push the EASY TIMER knob on the VCR. The SEARCH MODE indicator turns off. The VCR fast-forwards to the end of the tape. Then, the VCR rewinds the tape to the last recorded program. After a few seconds, the VCR starts playback and stops at the beginning of the blank section.



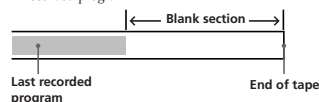
"BLANK" and the remaining time of the blank section appear alternately in the display window for about one minute.

### To stop searching

To stop the VCR while searching for a blank section, press ■ STOP.

### Notes

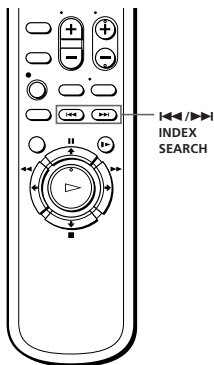
- To display the remaining time correctly you may have to select the SELEC DE CINTA in the AJUSTES ESPECIALES according to the type of the tape that you are using. For details, see page 56.
- In step 2, "FULL" will appear in the display window for about one minute, if:
  - there is no blank section available on the tape.
  - the remaining time of a blank section is less than one minute.
- The VCR can only detect the blank section between the end of the tape and the end of the last recorded program.



42 | Search Operations

## Searching using the index function

The VCR marks the tape with an index signal at the point where each recording begins. Use these signals as references to find a specific recording. The VCR can search up to 99 index signals ahead of or behind the current position. You can either use the INDEX SEARCH buttons on the remote commander or the SEARCH MODE button and EASY TIMER knob on the VCR.



### Before you start...

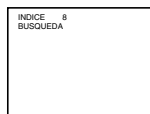
- Turn on the VCR and the TV.
- Set the TV to the video channel.

### Using the INDEX SEARCH buttons on the remote commander

- 1 Insert an indexed tape into the VCR.
- 2 Press ◀◀/▶▶ INDEX SEARCH repeatedly to specify how many index signals ahead or behind you want to search:

- To search ahead, press ▶▶ INDEX SEARCH.
- To search backwards, press ◀◀ INDEX SEARCH.

The VCR starts searching and the index number on the TV screen counts down to zero. Playback starts from the point about five seconds ahead of the specified index mark.

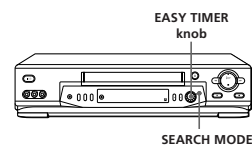


continued

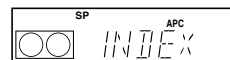
Search Operations | 43

## Searching using the index function (continued)

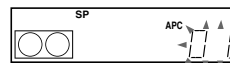
### Using the SEARCH MODE button and EASY TIMER knob on the VCR



- 1 Press SEARCH MODE on the VCR repeatedly until "INDEX" appears in the VCR's display window (the SEARCH MODE indicator lights up).



- 2 Turn the EASY TIMER knob to specify how many index signals ahead or behind you want to search:
  - To search ahead, turn the EASY TIMER knob clockwise.
  - To search backwards, turn the EASY TIMER knob counterclockwise.



- 3 Push the EASY TIMER knob. The VCR starts searching. Playback starts (the SEARCH MODE indicator turns off) from the point about five seconds ahead of the specified index mark.

### To stop searching

Press ■ STOP.

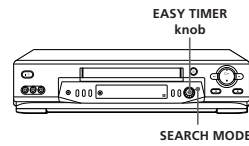
### Note

- No index signal will be added when recording starts from recording pause. However, an index signal will be marked if you change the channel during recording pause.

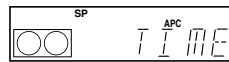
44 | Search Operations

## Searching using the Time Search function

You can easily find a specific point on a tape by using the Time Search function. For example, you can find a recorded section 15 minutes ahead of or behind the current position of a tape by using the Time Search function.



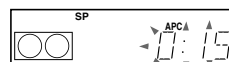
- 1 Press SEARCH MODE repeatedly until "TIME" appears in the display window (the SEARCH MODE indicator lights up).



- 2 Turn the EASY TIMER knob clockwise or counterclockwise to set the length of time you want the VCR to fast-forward or rewind the tape. Each turn on the knob increases or decreases the duration by 15 minutes.

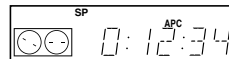
For example, if you want to watch a recorded section 15 minutes ahead of the current position, turn the EASY TIMER knob once clockwise.

To change the time by one minute, press CHANNEL +/-.



- 3 Push the EASY TIMER knob.

The VCR starts searching and the tape counter starts counting until it reaches the specified point.



The VCR starts playback automatically when the tape counter reaches the specified point (the SEARCH MODE indicator turns off).

### To stop searching

Press ■ STOP.

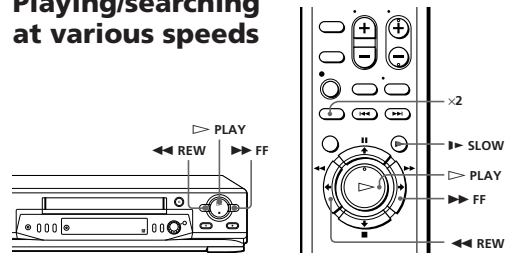
### Tip

- The VCR can search up to three hours ahead of or behind the current position of a tape.

Search Operations | 45

## Additional Operations

## Playing/searching at various speeds



| Playback options                               | Operation                                                                                                                                                                                                                        |
|------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| View the picture during fast-forward or rewind | During fast-forward, hold down ►► FF down. During rewind, hold down ◀◀ REW.                                                                                                                                                      |
| Play at high speed                             | <ul style="list-style-type: none"> <li>• During playback, press ►► FF or ◀◀ REW on the remote commander.</li> <li>• During playback, hold down ►► FF or ◀◀ REW. When you release the button, normal playback resumes.</li> </ul> |
| Play at twice the normal speed                 | During playback or pause, press x2.                                                                                                                                                                                              |
| Play in slow motion                            | During playback or pause, press ►► SLOW.                                                                                                                                                                                         |
| Play frame by frame                            | During pause, press ►► FF or ◀◀ REW on the remote commander. Hold down the button to play one frame each second.                                                                                                                 |
| Rewind and start play                          | While the tape is stopped, hold down ◀◀ REW on the VCR and press ►► PLAY on the VCR.                                                                                                                                             |

### To resume normal playback

Press ►► PLAY.

### Tips

- Adjust the picture using the TRACKING +/- buttons on the VCR if:
  - streaks appear while playing in slow motion.
  - the picture shakes during pause.
- To set tracking to the center position, press both buttons (+/-) at the same time.
- If noise appears during pause or frame-by-frame playback, first switch to the slow motion playback, then adjust the picture using TRACKING +/- on the VCR.

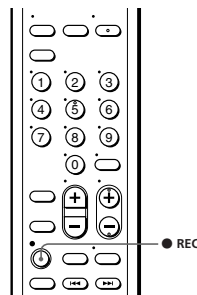
### Notes

- The sound is muted during these operations.
- In LP or EP mode, noise may appear or there may be no color.
- The picture may show noise when playing at high speed in reverse.

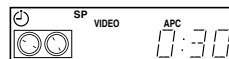
46 | Additional Operations

## Setting the recording duration time

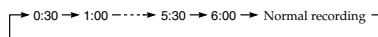
After you have started recording in the normal way, you can have the VCR stop recording automatically after a specified duration.



- 1 While recording, press ● REC. The ⌚ indicator appears in the display window.



- 2 Press ● REC repeatedly to set the duration. Each press advances the time in increments of 30 minutes.



The tape counter decreases minute by minute to 0:00, then the VCR stops recording and turns off automatically.

### To extend the duration

Press ● REC repeatedly to set to the new duration.

### To cancel the duration

Press ● REC repeatedly until the ⌚ indicator turns off and the VCR returns to normal recording mode.

### To stop recording

To stop the VCR while recording, press ■ STOP.

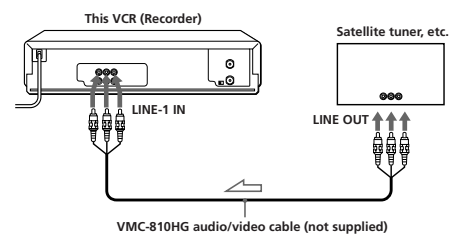
Additional Operations | 47

## Synchronized recording (SLV-EX90S AR only)

The Synchronized Recording feature enables you to record from the connected equipment such as a satellite tuner, a cable TV decoder or a TV that has a timer function. Once you set the timer on the other equipment, the VCR will start recording the program synchronized with the timer.

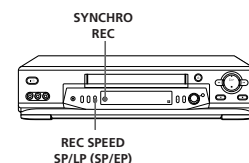
### Connections necessary to use this function

Connect the other equipment to the LINE-1 IN jacks of this VCR.



Signal flow

### How to make a Synchronized recording



- 1 Press INPUT SELECT or CH +/- on the remote commander to display "L1" in the display window.
- 2 Set the timer on the equipment to the time of the program you want to record, then turn it off.
- 3 Insert a tape with its safety tab in place. Make sure the tape is longer than the total recording time.

48 | Additional Operations

- 4 Press REC SPEED to select the tape speed (SP or LP for the PAL-N color system, and SP or EP for the NTSC color system).
- 5 Hold down SYNCHRO REC for more than two seconds.  
The SYNCHRO REC button lights up and the VCR stands by for recording.

The VCR automatically turns on and starts recording when it receives video/audio signals from the connected equipment.

#### To cancel the Synchronized recording

Press SYNCHRO REC so that the button's light turns off.

#### To stop recording

Press ■ STOP while recording.

The VCR automatically stops recording when the tape reaches the end or when the other equipment stops transmitting the video/audio signals.

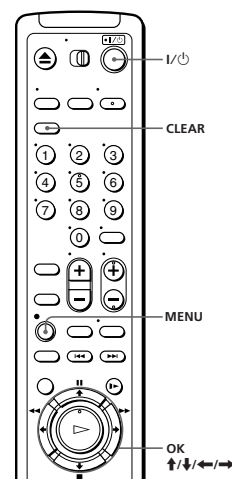
#### Notes

- Some TVs or other equipment automatically turn off in a certain amount of time if you do not operate it after it turns on with the timer. In this case the Synchronized Recording also stops automatically.
- The Synchronized Recording starts and stops according to the signals from the connected equipment. Refer also to the instruction manual of the connected equipment for information about its timer function.
- Some equipment keeps transmitting signals even though the power is off. In this case, the Synchronized Recording feature does not work because the VCR will not be able to know when to start recording. To record the program, set the timer on the VCR. If you use a satellite tuner or a cable TV decoder, make sure to turn it on. For details, see "Setting the timer manually".
- If the settings for timer recording and Synchronized Recording overlap, the program that starts first has priority and the second program starts recording only after the first program has finished.
- To record NTSC signals, set the tape speed to SP or EP. To record in the EP mode, set the tape speed to "LP".

## Checking/ changing/ canceling timer settings

#### Before you start...

- Turn on your TV and set it to the video channel.



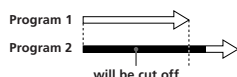
- 1 Press I/ψ to turn on the VCR.
- 2 Press MENU, then press ↑/↓ to select PROGRAM./VERIF. and press OK:
  - If you want to change or cancel a setting, go on to the next step.
  - If you do not need to change or cancel the settings, press OK, then turn off the VCR to return to recording standby.

| PROGRAM./VERIF.           | 28.9 VIE |
|---------------------------|----------|
| FECHA INICIO FIN CANAL    |          |
| 1. 000 8:00W 9:00W 35 35  |          |
| 2. 10MR 1:00W 1:30W 20 LP |          |
| UN-VE 2:00W 3:00W 60 LP   |          |
| 1000 5M 6:30W 7:00W 42 LP |          |
| ---                       | ---      |
| ---                       | ---      |
| ---                       | ---      |
| ---                       | ---      |
| ---                       | ---      |

- 3 Press ↑/↓ to select the setting you want to change or cancel:
  - To change the setting, press ←/→ to select the item you want to change, and press ↑/↓ to reset it. Then, press → repeatedly until the cursor (►) appears at the beginning of the line.
  - To cancel the setting, press CLEAR.
- 4 Press OK.  
If any timer settings remain, turn off the VCR to return to recording standby.

#### When the timer settings overlap

The program that starts first has priority and the second program starts recording only after the first program has finished. If the programs start at the same time, the program listed first in the menu has priority.



## Recording stereo and bilingual programs (SLV-EX90S AR/EX80S AR only)

#### Recording stereo programs

This VCR automatically receives and records stereo programs. When a stereo program is received, the STEREO indicator lights up. If there is noise in the stereo program, set AUTO ESTEREO in the AJUSTES ESPECIALES to NO. The sound will be recorded in monaural (on both hi-fi and normal audio tracks) but with less noise. For details, see page 56.

#### Recording bilingual programs

Normally, this VCR records only the main sound. When a SAP (Second Audio Program) is received, the SAP indicator appears on the TV screen for a few seconds. To record only SAP sound, set SELEC. AUDIO in the AJUSTES ESPECIALES to SAP. For details, see page 56.

#### Selecting the sound during playback

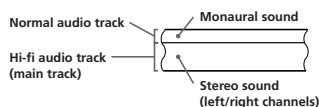
Press AUDIO MONITOR to select the sound you want. (If you are recording, the sound being recorded will not change.)

| To listen to                              | On-screen display | Display window |
|-------------------------------------------|-------------------|----------------|
| Stereo                                    | ESTEREO           | STEREO         |
| Left channel                              | CAN. I            | STEREO         |
| Right channel                             | CAN. D            | STEREO         |
| Monaural sound on the normal audio track* | No indicator      | No indicator   |

\* Usually the mixed sound of left and right channels (monaural)

## How sound is recorded on a video tape

The VCR records sound onto two separate tracks. Hi-fi audio is recorded onto the main track along with the picture. Monaural sound is recorded onto the normal audio track along the edge of the tape.



### Notes

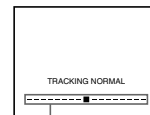
- To play a tape in stereo, you must use the A/V connections.
- When you play a tape recorded in monaural, the sound is heard in monaural regardless of the AUDIO MONITOR setting.
- If the AUDIO MONITOR button does not function, check that MEZCL. AUDIO in the AJUSTES ESPECIALES is set to NO. For details, see page 56.

## Adjusting the picture

### Adjusting the tracking

Although the VCR automatically adjusts the tracking when playing a tape (the  indicator flashes in the display window, then turns off), distortion may occur if the recording is in poor condition. In this case, manually adjust the tracking.

Press the TRACKING +/- buttons on the VCR to display the tracking meter. The distortion should disappear as you press one of the two tracking buttons (the  indicator lights up). To resume automatic tracking adjustment, eject the tape and re-insert it.

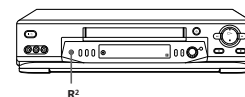


Tracking meter

### About the R<sup>2</sup> (Reality Regenerator) function (SLV-EX90S AR only)

The R<sup>2</sup> function automatically adjusts the picture to the most suitable quality during playback.

When playback starts, the R<sup>2</sup> function activates and the R<sup>2</sup> button lights up.



Each press of the button changes the effect and indication in the display window as follows:

REAL (status of playback started) → SOFT → DYNA (dynamic)  
↑

## About the Adaptive Picture Control (APC) function

The Adaptive Picture Control (APC) function automatically improves recording and playback quality by adjusting the VCR to the condition of the video heads and tape. To maintain better picture quality, we recommend that you set APC to SI in the AJUSTES ESPECIALES (The APC indicator lights up in the display window). For details, see page 56.

| AJUSTES ESPECIALES |                       |     |  |
|--------------------|-----------------------|-----|--|
| AUTO ANT SEL       | •SI                   | NO  |  |
| AUTO ESTEREO       | •SI                   | NO  |  |
| MEZCL. AUDIO       | •SI                   | NO  |  |
| SELEC. AUDIO       | •MAIN                 | SAP |  |
| APC                | •SI                   | NO  |  |
| NTSC PB            | •ON PAL-N TV NTSC3.58 |     |  |
| SELEC DE CINTA     | •AUTO 180             |     |  |
| SELECCIONAR        | : [♦♦]                |     |  |
| AJUSTAR            | : [♦♦]                |     |  |

### APC playback

The APC function automatically works on all types of tapes, including rental tapes and tapes that were not recorded with APC.

### APC recording

Whenever you insert a tape and first start recording, the VCR adjusts to the tape using the APC function (the APC indicator flashes rapidly). This adjustment is retained until the tape is ejected.

### To deactivate the APC function

Set APC to NO in the AJUSTES ESPECIALES. The APC indicator in the display window turns off.

### Tip

- To set the tracking to the center position, press the TRACKING + and - buttons at the same time.

### Note

- There is a delay of a few seconds before the VCR actually starts recording while the VCR analyzes the tape. To avoid the delay, first set the VCR to recording pause (the APC indicator flashes slowly) and press  REC to have the VCR analyze the tape (the APC indicator flashes rapidly). After the APC indicator stops flashing, press  PAUSE to start recording immediately. If you press  PAUSE before the APC indicator stops flashing, the APC function is cancelled.

## Changing menu options

- Press MENU, then select AJUSTES ESPECIALES.

### SLV-EX90S AR/EX80S AR

| AJUSTES ESPECIALES |                       |     |  |
|--------------------|-----------------------|-----|--|
| AUTO ANT SEL       | •SI                   | NO  |  |
| AUTO ESTEREO       | •SI                   | NO  |  |
| MEZCL. AUDIO       | •SI                   | NO  |  |
| SELEC. AUDIO       | •MAIN                 | SAP |  |
| APC                | •SI                   | NO  |  |
| NTSC PB            | •ON PAL-N TV NTSC3.58 |     |  |
| SELEC DE CINTA     | •AUTO 180             |     |  |
| SELECCIONAR        | : [♦♦]                |     |  |
| AJUSTAR            | : [♦♦]                |     |  |

### SLV-EX50 AR

| AJUSTES ESPECIALES |                       |    |  |
|--------------------|-----------------------|----|--|
| AUTO ANT SEL       | •SI                   | NO |  |
| APC                | •SI                   | NO |  |
| NTSC PB            | •ON PAL-N TV NTSC3.58 |    |  |
| SELEC DE CINTA     | •AUTO 180             |    |  |
| SELECCIONAR        | : [♦♦]                |    |  |
| AJUSTAR            | : [♦♦]                |    |  |

- Press  /  to select the option, then press  /  to change the setting.
- Press OK to return to the original screen.

### Menu choices

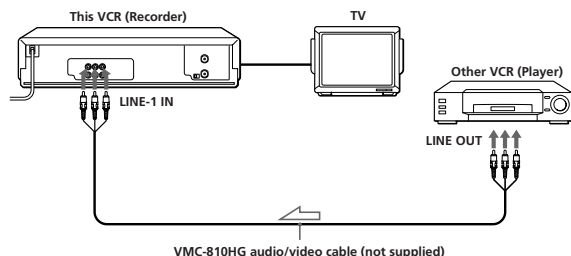
Initial settings are indicated in bold print.

| Menu option                               | Set this option to                                                                                                                                                                                                                                                        |
|-------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| AUTO ANT SEL                              | <b>SI</b> if your TV is connected only to VHF/UHF OUT on the VCR. To play a tape, set the TV to the VCR channel (channel 3 or 4).<br>NO if your TV is connected to both VHF/UHF OUT and LINE OUT on the VCR. To play a tape, set the TV to the VCR input.                 |
| AUTO ESTEREO (SLV-EX90S AR/EX80S AR only) | <b>SI</b> to receive stereo programs.<br>NO to reduce noise. The sound changes to monaural.                                                                                                                                                                               |
| MEZCL. AUDIO (SLV-EX90S AR/EX80S AR only) | <b>SI</b> to listen to the hi-fi and normal audio tracks at the same time. The AUDIO MONITOR button will not function.<br><b>NO</b> to listen to the hi-fi and normal audio tracks separately. Select the sound using the AUDIO MONITOR button. For details, see page 52. |
| SELEC. AUDIO (SLV-EX90S AR/EX80S AR only) | <b>MAIN</b> to record the main sound.<br>SAP to record the SAP (Second Audio Program) sound.                                                                                                                                                                              |
| APC                                       | <b>SI</b> to switch on the APC (Adaptive Picture Control) function and improve picture quality.<br>NO to switch off APC.                                                                                                                                                  |
| NTSC PB                                   | <b>ON PAL-N TV</b> to play back an NTSC-recorded tape on a PAL-N TV.<br>NTSC 3.58 to playback an NTSC-recorded tape on an NTSC TV. For details, see page 26.                                                                                                              |
| SELEC DE CINTA                            | <b>AUTO</b> when using a T-160 length tape or any tape shorter than a T-140 length tape<br>180 when using a T-140 or T-180 length tape.                                                                                                                                   |

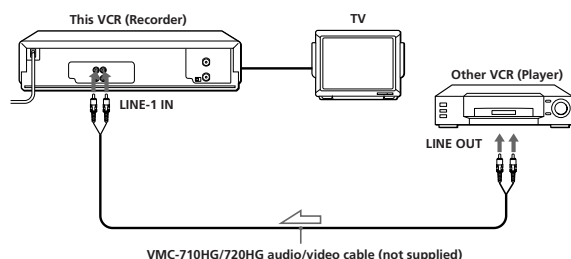
## Editing with another VCR

### How to connect to record on this VCR

For SLV-EX90S AR and EX80S AR only



For SLV-EX50 AR only



Signal flow

continued

Additional Operations | 57

## Editing with another VCR (continued)

### How to connect to a stereo system (SLV-EX90S AR/EX80S AR only)

Connect the LINE-1 IN AUDIO R/L or LINE-2 IN AUDIO L/R jacks on this VCR to the audio output jacks on the stereo system, using the RK-C510HG audio cable (not supplied).

#### Tips

- (For SLV-EX50 AR only)  
Use commercially available connecting cable such as the Sony VMC-710HG/720HG (2-phono to 2-phono). If the other VCR has the AUDIO L and R jacks, use a connecting cable such as the Sony VMC-910HG (3-phono to 2-phono).
- (For SLV-EX90S AR/EX80S AR only)  
If the other VCR is a monaural type, the sound is recorded only on the channel whose jack is connected to the audio plug. To record on both right and left channels, connect the audio plugs to the AUDIO R/L jacks using a VMC-910HG (3-phono to 2-phono) audio/video cable (not supplied).

#### Notes

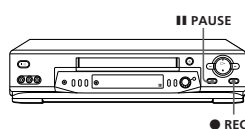
- Make sure you connect the plugs to jacks of the same color.
- (For SLV-EX90S AR/EX80S AR only)  
When you connect a monaural VCR to the LINE-1 IN or LINE-2 IN jacks, make sure to connect the audio plug to the AUDIO L (white) jack. The sound is recorded on both right and left channels. When connecting to the AUDIO R (red) jack, the sound is recorded only on the right channel.
- If you connected this VCR to both the LINE IN and LINE OUT jacks of the other VCR, select the input correctly to prevent humming noise.

## Operation

### (when recording on this VCR)

#### Before you start editing

- Turn on your TV and set it to the video channel.
- Press INPUT SELECT or CH +/- to display "L1" or "L2" (SLV-EX90S AR/EX80S AR only) in the display window.
- Press REC SPEED to select the tape speed (SP or LP for the PAL-N system, and SP or EP for the NTSC system).



- 1 Insert a source tape with its safety tab removed into the other (playback) VCR. Search for the point to start playback and set it to playback pause.
- 2 Insert a tape with its safety tab in place into this (recording) VCR. Search for the point to start recording and press PAUSE.
- 3 Press REC on this VCR to set it to recording pause.
- 4 To start editing, press the PAUSE buttons on both VCRs at the same time.

#### To stop editing

Press the STOP buttons on both VCRs.

#### Tips

- To edit more precisely, press the PAUSE buttons on the VCRs to release pause.
- To cut out unwanted scenes while editing, press PAUSE on this VCR when an unwanted scene begins. When it ends, press PAUSE again to resume recording.

#### Note

- If you start recording following the procedure above, the VCR won't start recording with the APC function. To record a tape with the APC function, press REC again during recording pause in step 3 so that the VCR analyzes the tape. Then, press PAUSE after the APC indicator stops flashing to start recording. If you press PAUSE before the APC indicator stops flashing, the APC function is canceled.

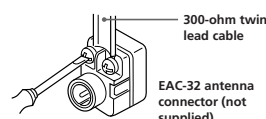
Additional Operations | 59

## Additional Information

## General setup information

### Attaching the external antenna connector

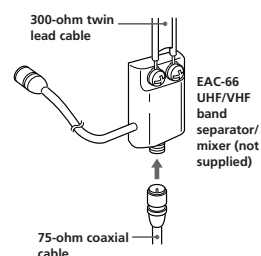
When using a 300-ohm twin lead cable for a VHF/UHF antenna, use the EAC-32 antenna connector (not supplied) to connect the antenna to the VCR.



- 1 Loosen the screws on the antenna connector.
- 2 Wind the twin leads around the screws on the antenna connector.
- 3 Retighten the screws.

### Attaching a UHF/VHF band mixer

When using both a 75-ohm coaxial cable and a 300-ohm twin lead cable for a VHF/UHF antenna, use the EAC-66 UHF/VHF band separator/mixer (not supplied) to connect the antenna to the VCR.



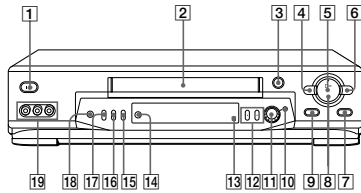
- 1 Loosen the screws on the mixer.
- 2 Wind the twin leads around the screws on the mixer.
- 3 Retighten the screws.
- 4 Connect the 75-ohm coaxial cable to the mixer.

60 | Additional Information

## Index to parts and controls

Refer to the pages indicated in parentheses ( ) for details.

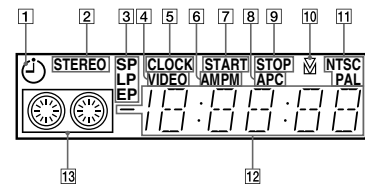
### Front panel



- |                                                      |                                                                               |
|------------------------------------------------------|-------------------------------------------------------------------------------|
| 1 I/⏻ POWER switch (13, 38)                          | 12 CHANNEL/TRACKING +/- buttons (29, 54)                                      |
| 2 Tape compartment                                   | 13 Remote sensor (5)                                                          |
| 3 EJECT button (26)                                  | 14 SYNCHRO REC button (48) (SLV-EX90S AR only)                                |
| 4 ◀◀ REW (rewind) button (26, 46)                    | 15 REC SPEED SP (Standard Play)/LP (Long Play)/EP (Extended Play) button (29) |
| 5 ▷ PLAY button (26)                                 | 16 COLOR SYSTEM button (26)                                                   |
| 6 ▶▶ FF (fast-forward) button (26, 46)               | 17 ONE TOUCH TUNING button (16)                                               |
| 7 ● REC (record) button (29)                         | 18 R <sup>2</sup> (Reality Regenerator) button (54) (SLV-EX90S AR only)       |
| 8 ■ STOP button (26)                                 | 19 LINE-2 IN VIDEO/AUDIO L/R jacks (58) (SLV-EX90S AR/EX80S AR only)          |
| 9    PAUSE button (26)                               |                                                                               |
| 10 SEARCH MODE button/indicator (40, 41, 42, 44, 45) |                                                                               |
| 11 EASY TIMER knob (31, 40, 41, 42, 44, 45)          |                                                                               |

## Index to parts and controls (continued)

### Display window



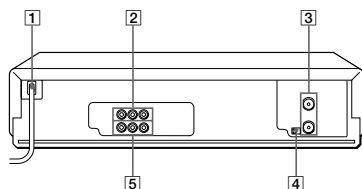
- |                                                      |                                                               |
|------------------------------------------------------|---------------------------------------------------------------|
| 1 Timer indicator (38)                               | 8 APC (Adaptive Picture Control) indicator (55)               |
| 2 STEREO indicator (52) (SLV-EX90S AR/EX80S AR only) | 9 STOP indicator (32)                                         |
| 3 Tape speed indicator (29)                          | 10 Tracking indicator (54)                                    |
| 4 VIDEO indicator (13, 30)                           | 11 Color system indicator (26)                                |
| 5 CLOCK indicator (33)                               | 12 Time counter/clock/line/channel indicator (27, 29, 33, 59) |
| 6 AM/PM indicator (33)                               | 13 Tape/recording indicator (29)                              |
| 7 START indicator (31)                               |                                                               |

continued

Additional Information | 65

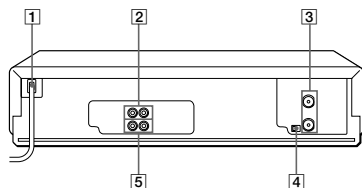
66 | Additional Information

### Rear panel (SLV-EX90S AR/EX80S AR)



- |                                             |                                         |
|---------------------------------------------|-----------------------------------------|
| 1 AC power cord                             | 4 RF (Radio Frequency) UNIT switch (13) |
| 2 LINE-1 IN AUDIO R/L/VIDEO jacks (57)      | 5 LINE OUT AUDIO/VIDEO R/L jacks (7)    |
| 3 VHF/UHF IN/OUT connectors (9, 10, 11, 12) |                                         |

### Rear panel (SLV-EX50 AR)



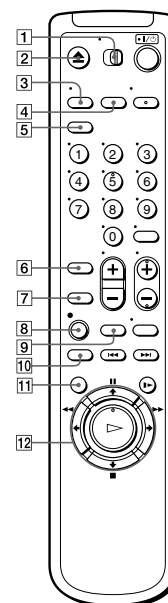
- |                                             |                                         |
|---------------------------------------------|-----------------------------------------|
| 1 AC power cord                             | 4 RF (Radio Frequency) UNIT switch (13) |
| 2 LINE-1 IN AUDIO/VIDEO jacks (57)          | 5 LINE OUT AUDIO/VIDEO jacks (8)        |
| 3 VHF/UHF IN/OUT connectors (9, 10, 11, 12) |                                         |

continued

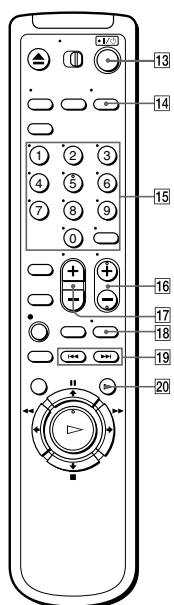
Additional Information | 67

## Index to parts and controls (continued)

### Remote commander



- |                                                                        |
|------------------------------------------------------------------------|
| 1 TV/VIDEO remote control switch (5)                                   |
| 2 EJECT button (26)                                                    |
| 3 TV/VIDEO button (for TV) (13, 30)                                    |
| 4 INPUT SELECT button (30, 38)                                         |
| 5 CLEAR button (27, 51)                                                |
| 6 EASY TIMER button (34)                                               |
| 7 R <sup>2</sup> (Reality Regenerator) button (54) (SLV-EX90S AR only) |
| 8 ● REC button (29, 47)                                                |
| 9 REC SPEED button (29)                                                |
| 10 x2 button (46)                                                      |
| 11 MENU button (10, 56)                                                |
| 12 Tape/menu operation buttons                                         |
| PAUSE/↑ button (26)                                                    |
| ■ STOP/↓ button (26)                                                   |
| ◀◀ REW (rewind)/◀ button (26, 46)                                      |
| ▶▶ FF (fast-forward)/▶ button (26, 46)                                 |
| ▷ PLAY/OK button (26)                                                  |

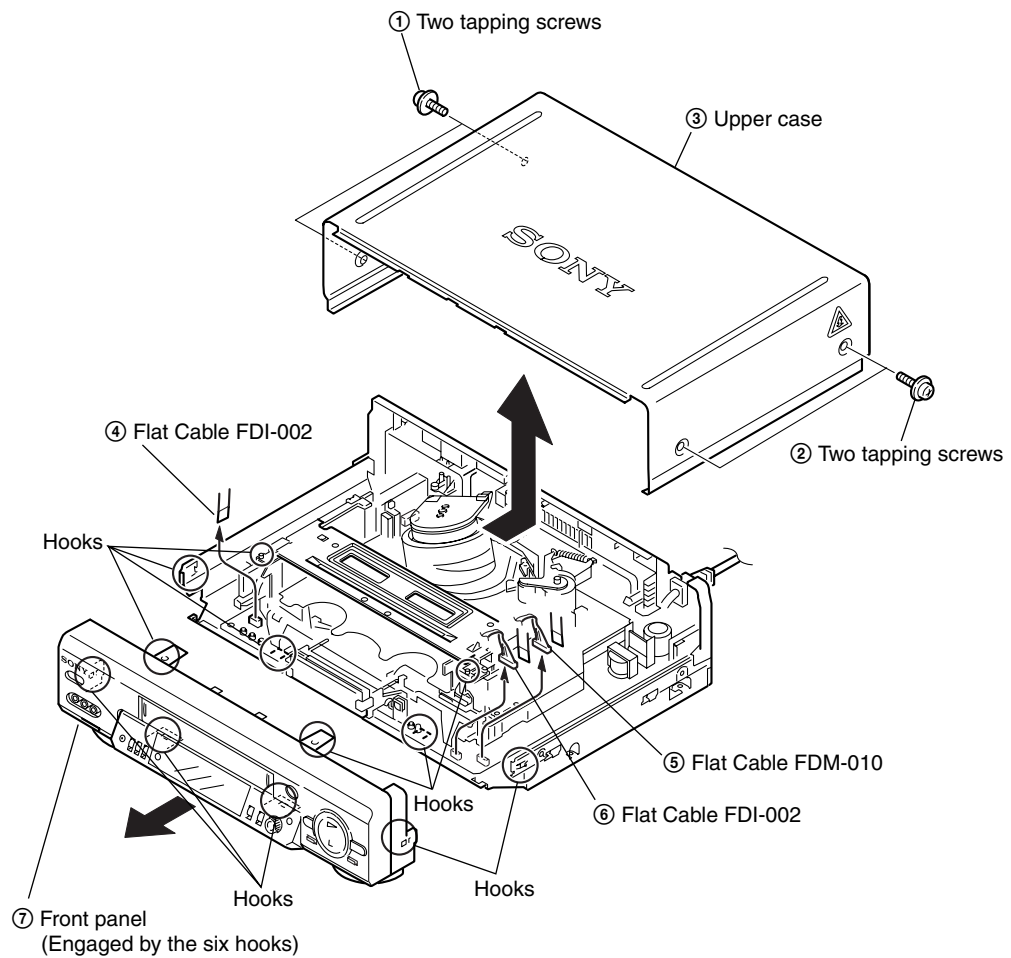


- 13 I/O (power) switch (38)
- 14 AUDIO MONITOR button (52)  
(This button doesn't work for SLV-EX50 AR only)
- 15 Number buttons and ENTER (AM/PM) buttons (20, 30, 33)
- 16 CH (channel) +/- buttons (20, 29)
- 17 VOL (volume) +/- buttons (for TV)
- 18 DISPLAY button (27, 29)
- 19 ◀▶/▶▶ INDEX SEARCH buttons (43)
- 20 ▶▶ SLOW button (46)

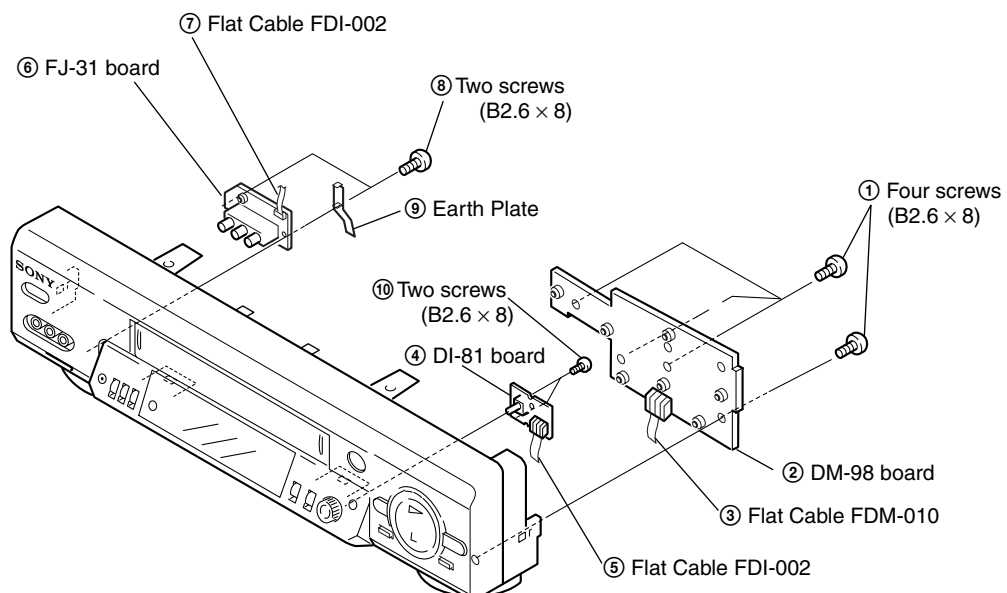
## SECTION 2 DISASSEMBLY

**NOTE:** Follow the disassembly procedure in the numerical order given.

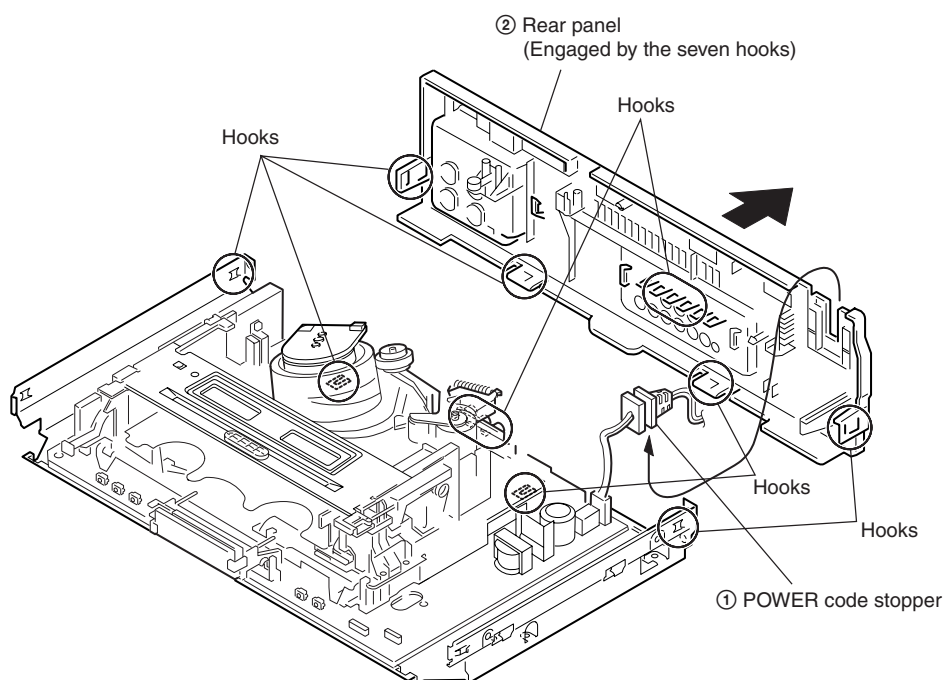
### 2-1. CASE, FRONT PANEL BLOCK ASSEMBLY



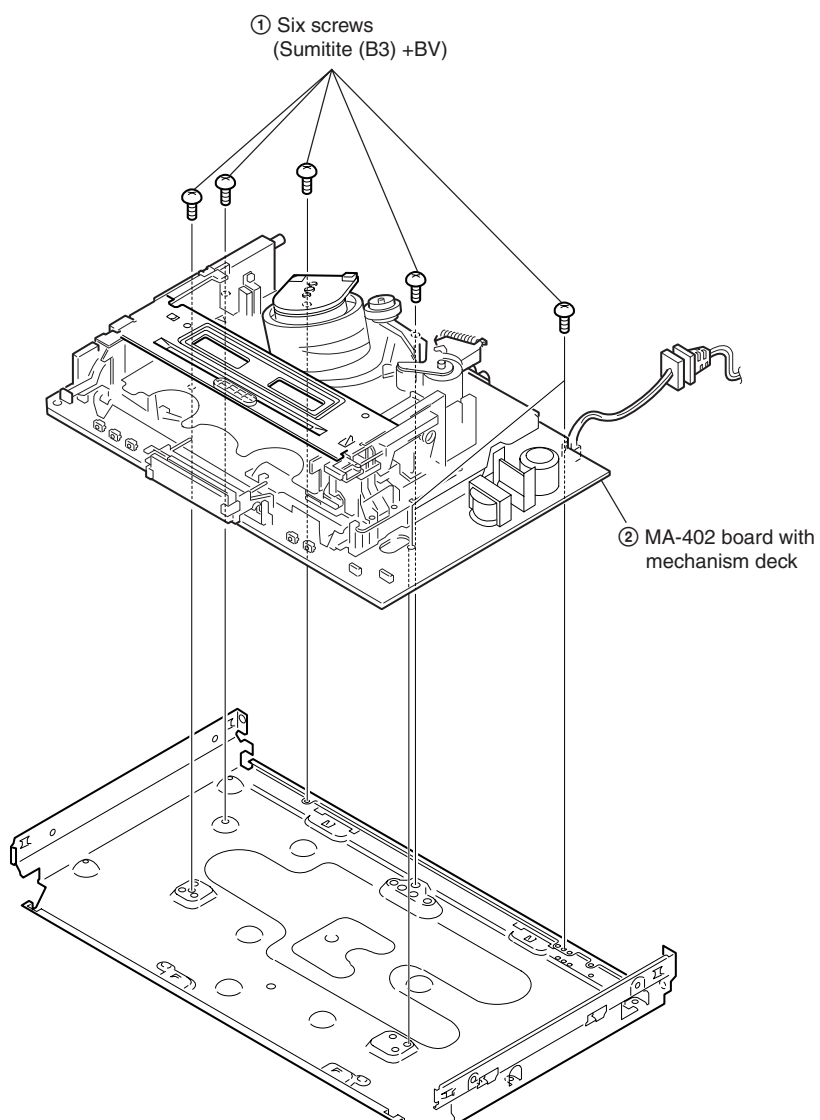
### 2-2. DM-98 BOARD, DI-81 BOARD, FJ-31 BOARD



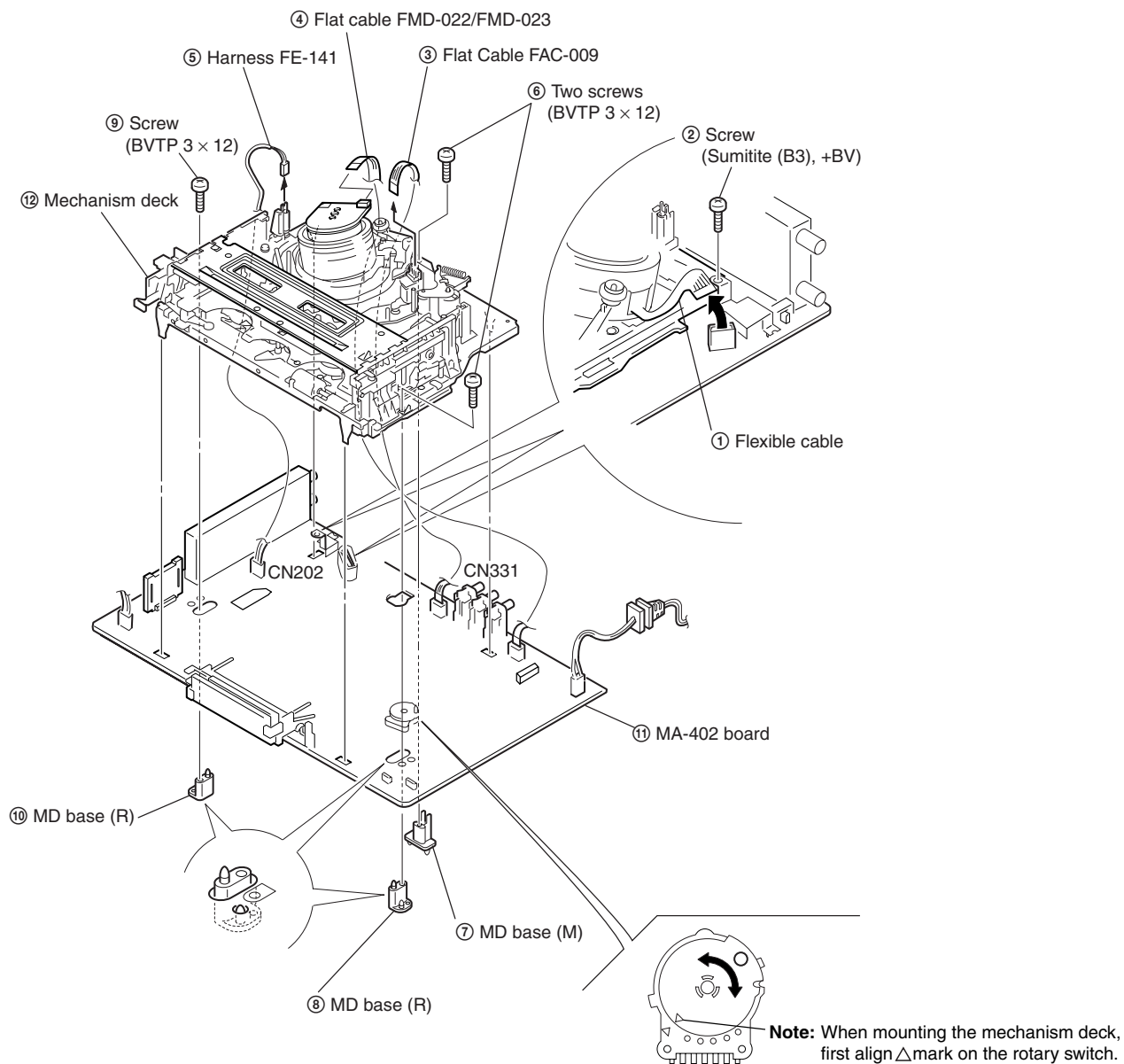
### 2-3. REAR PANEL



### 2-4. MA-402 BOARD

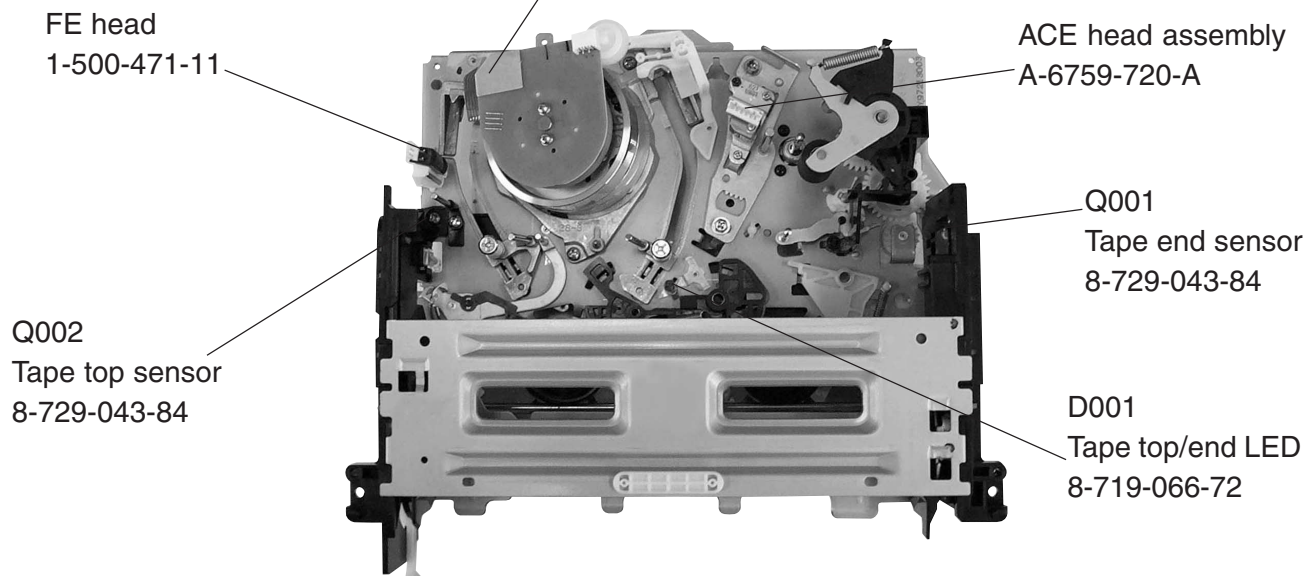


## 2-5. MECHANISM DECK



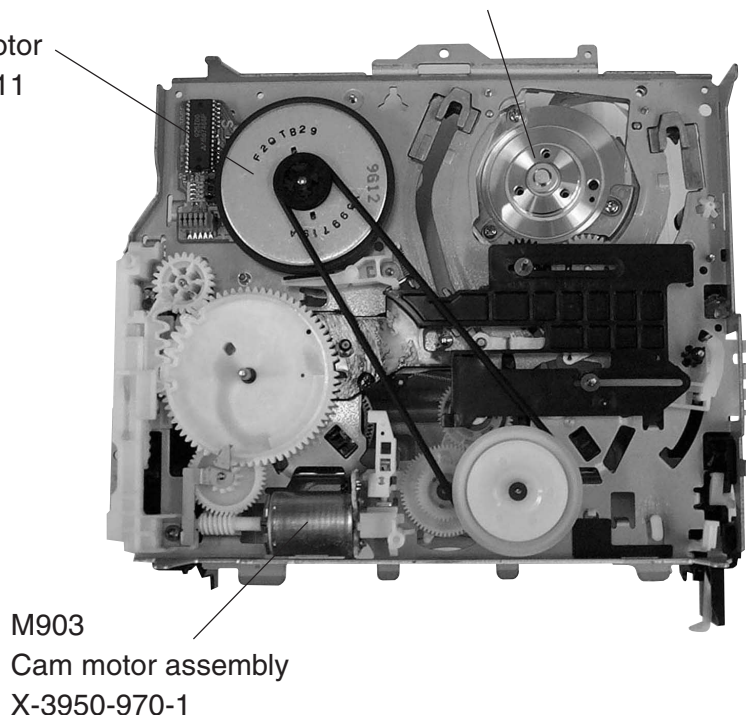
## 2-6. INTERNAL VIEWS

Drum assembly (M901) (DZH-0D0A-R)  
1-796-011-11 (SLV-EX50AR)  
Drum assembly (M901) (DZH-0D1A-R)  
1-796-012-11 (SLV-EX80SAR/EX90SAR)  
Drum assembly (M901) (DZH-0B4A-R)  
1-772-363-11 (SLV-EX50BR)  
Drum assembly (M901) (DZH-0B7A-R)  
1-772-366-11 (SLV-EX80SBR/EX90SBR)

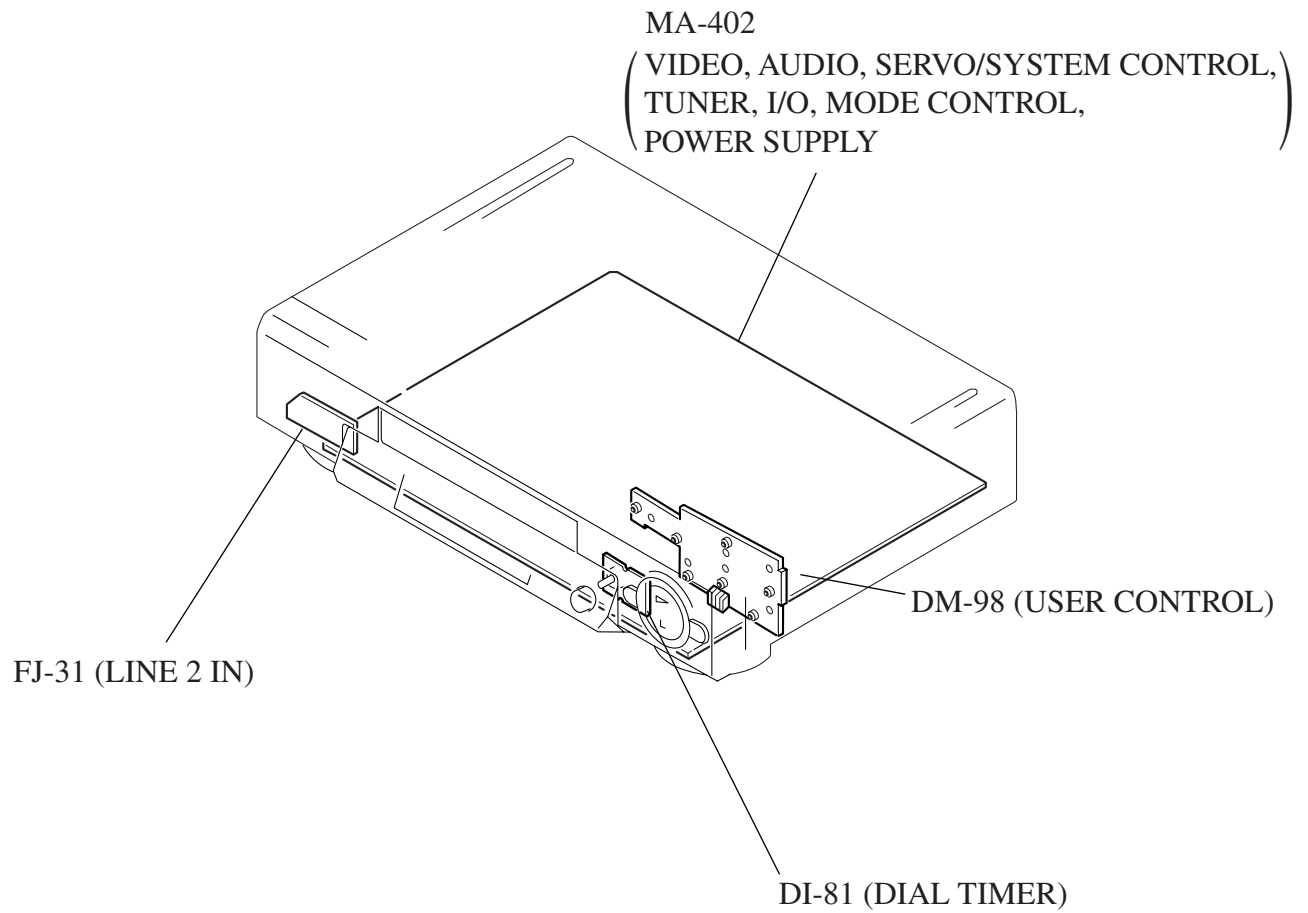


Drum assembly (M901) (DZH-0D0A-R)  
1-796-011-11 (SLV-EX50AR)  
Drum assembly (M901) (DZH-0D1A-R)  
1-796-012-11 (SLV-EX80SAR/EX90SAR)  
Drum assembly (M901) (DZH-0B4A-R)  
1-772-363-11 (SLV-EX50BR)  
Drum assembly (M901) (DZH-0B7A-R)  
1-772-366-11 (SLV-EX80SBR/EX90SBR)

M902  
Capstan motor  
1-763-572-11

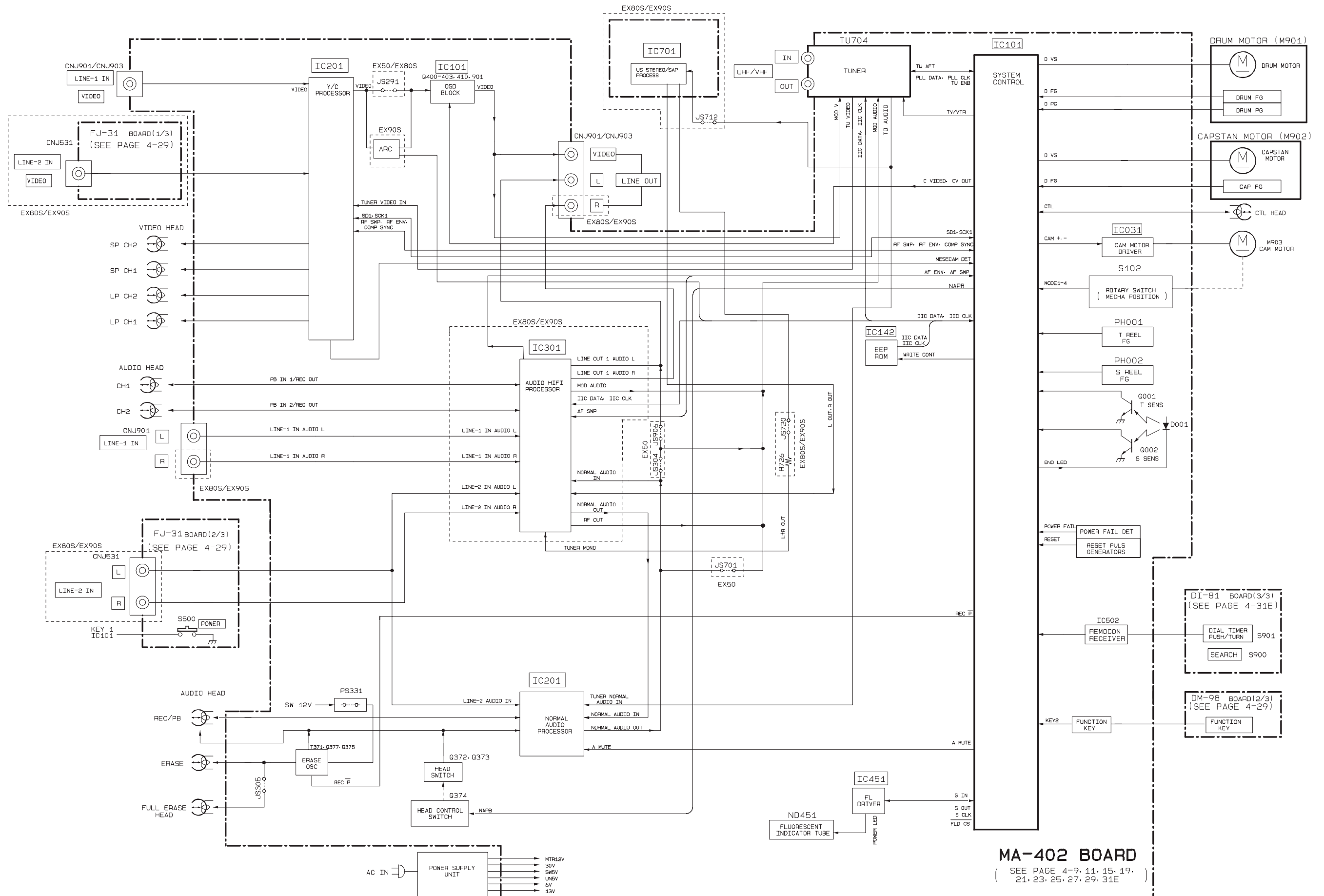


## 2-7. CIRCUIT BOARDS LOCATION

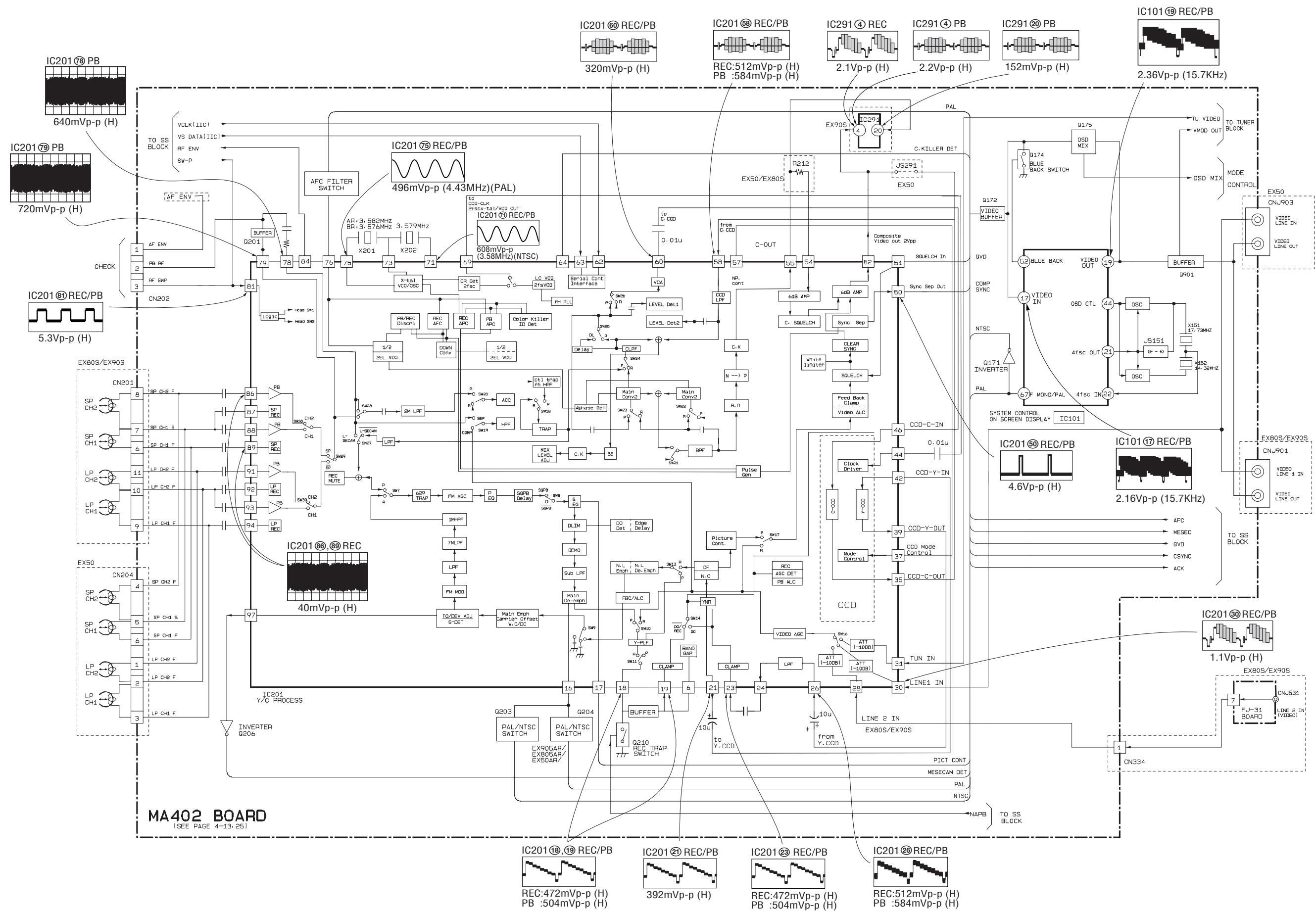


## SECTION 3 BLOCK DIAGRAMS

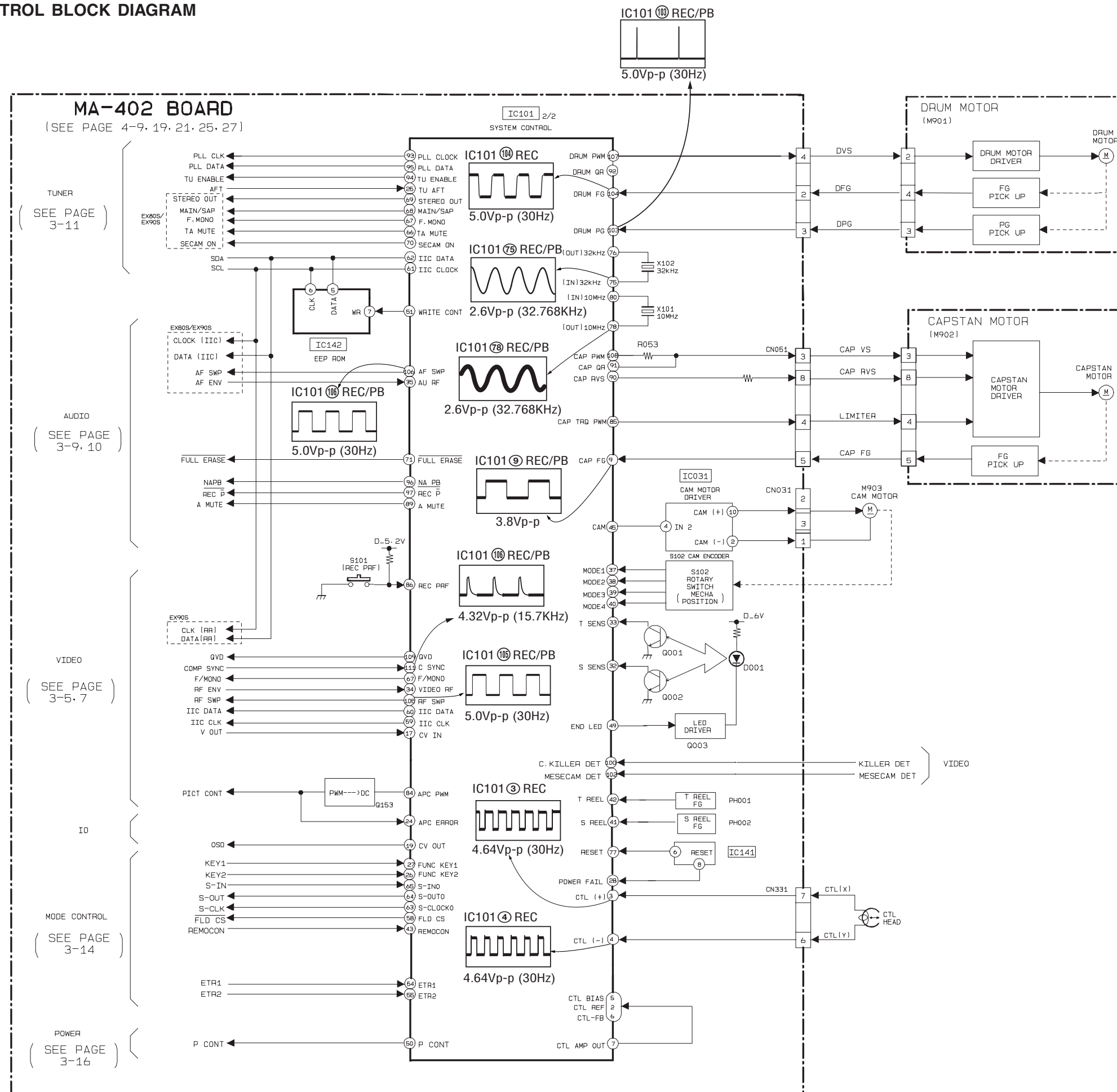
### 3-1. OVERALL BLOCK DIAGRAM

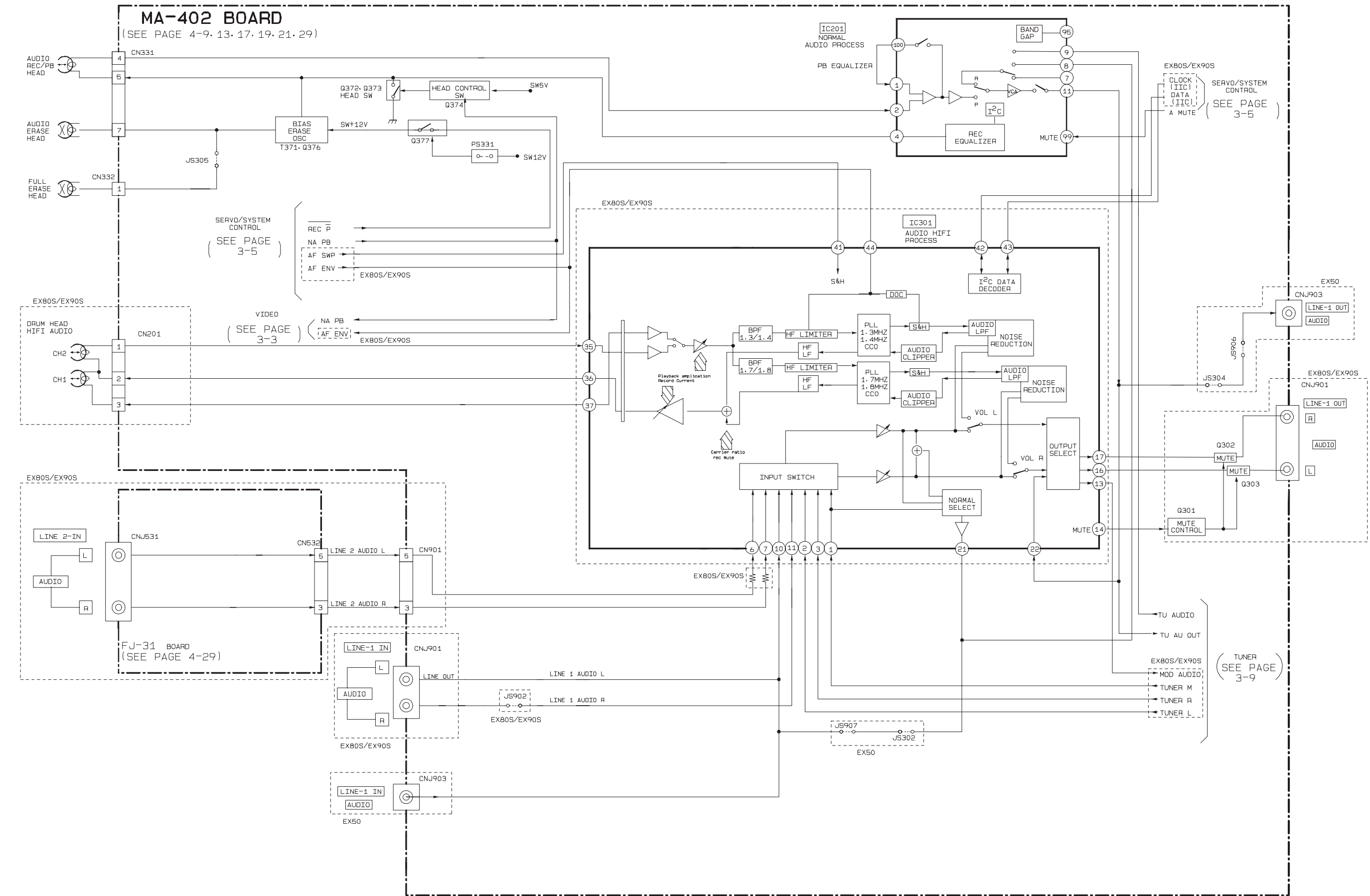


3-2. VIDEO BLOCK DIAGRAM

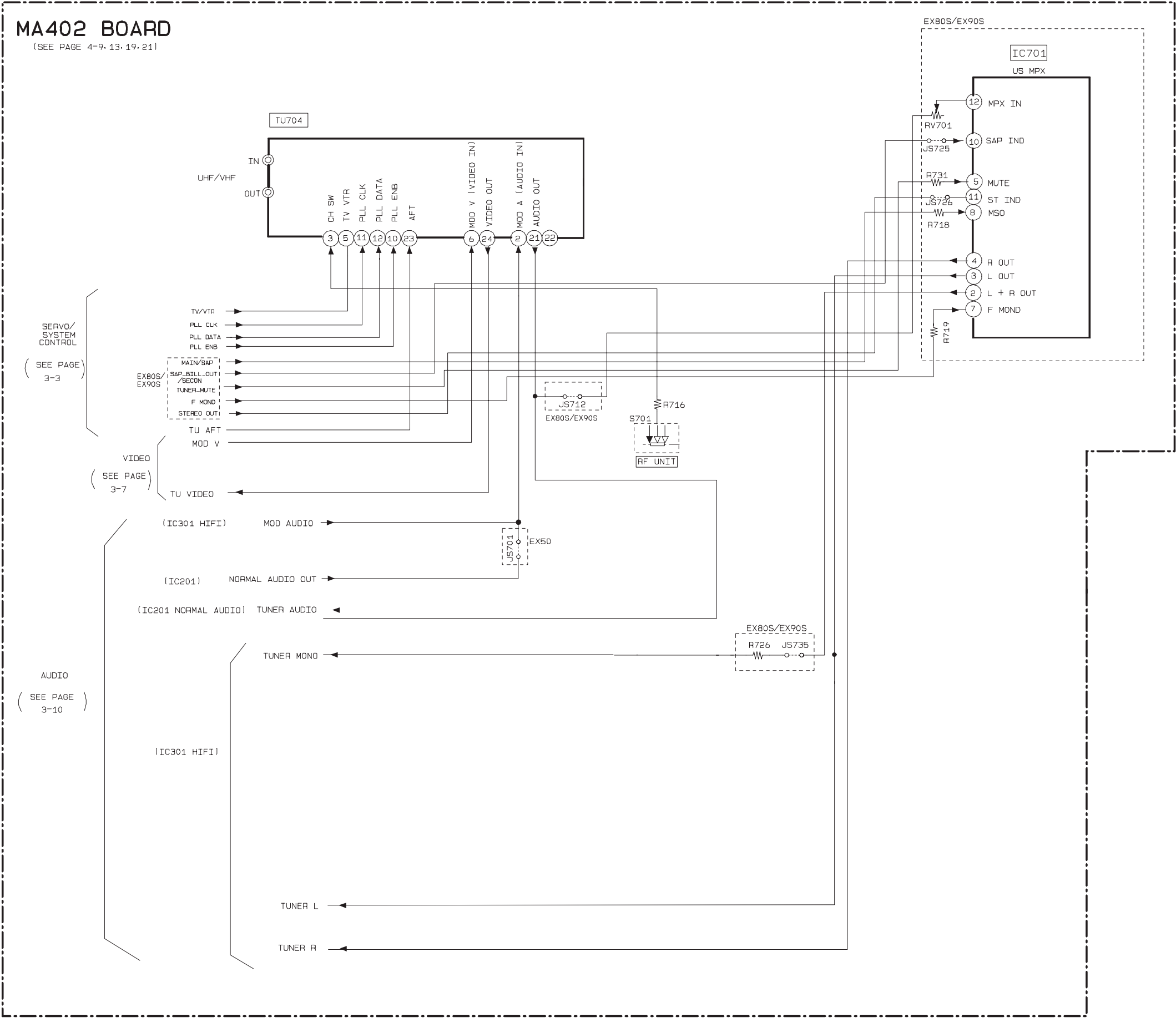


## 3-3. SERVO/SYSTEM CONTROL BLOCK DIAGRAM

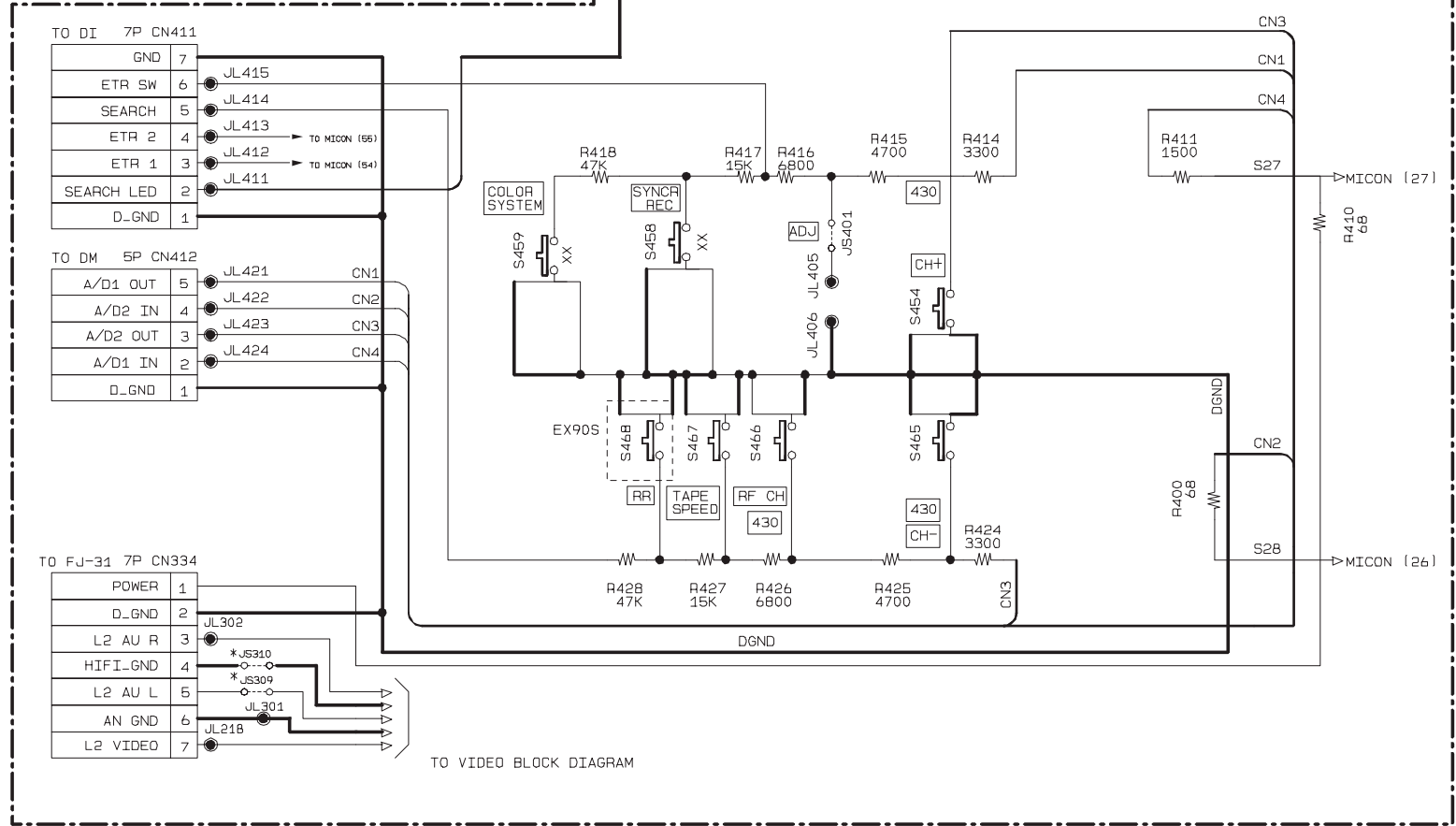
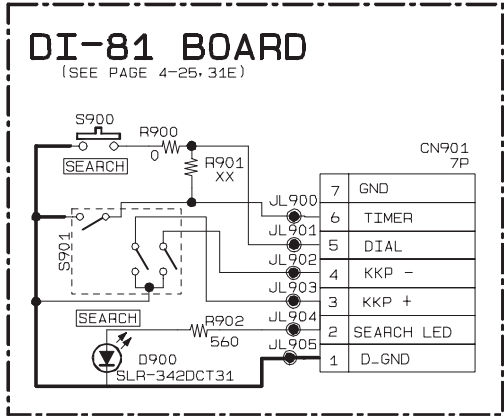
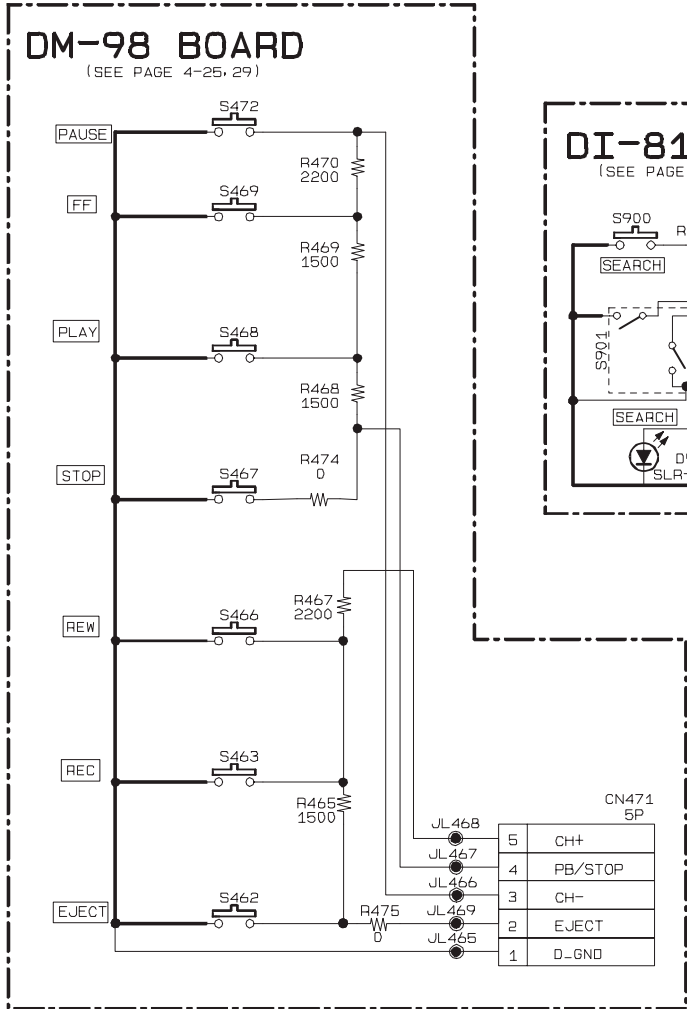
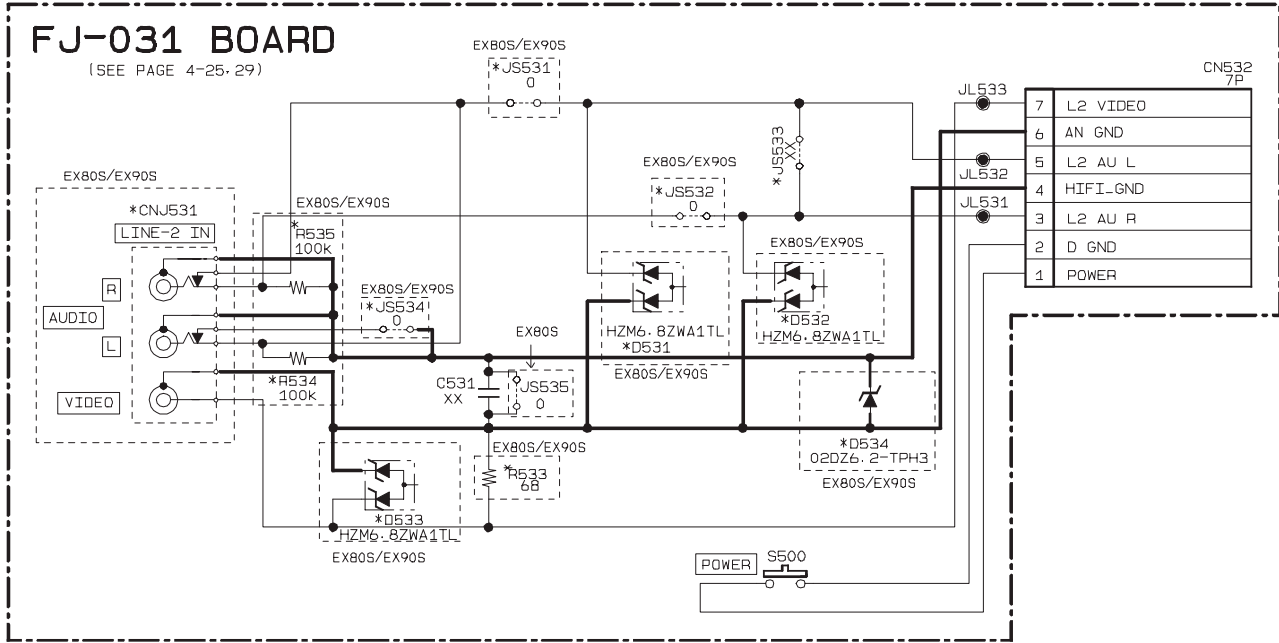


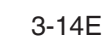


3-5. TUNER BLOCK DIAGRAM



### 3-6. MODE CONTROL BLOCK DIAGRAM



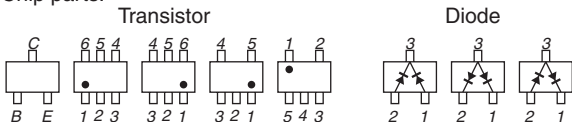


SECTION 4  
PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

**THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.**  
**(In addition to this, the necessary note is printed in each block.)**

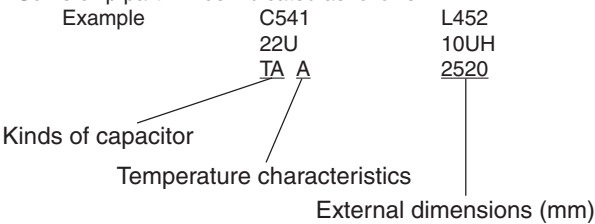
**(For printed wiring boards)**

-  : Pattern from the side which enables seeing.  
(The other layers' patterns are not indicated.)
- Through hole is omitted.
- Circled numbers refer to waveforms.
- There are few cases that the part printed on diagram isn't mounted in this model.
- Chip parts.



**(For schematic diagrams)**

- All capacitors are in  $\mu\text{F}$  unless otherwise noted.  $\text{pF}$  :  $\mu\mu\text{F}$ .  
50V or less are not indicated except for electrolytics and tantalums.
- Chip resistors are 1/10W unless otherwise noted.  
 $\text{k}\Omega=1000\Omega$ ,  $\text{M}\Omega=1000\text{k}\Omega$ .
- Caution when replacing chip parts.  
New parts must be attached after removal of chip.  
Be careful not to heat the minus side of tantalum capacitor, Because it is damaged by the heat.
- Some chip part will be indicated as follows.

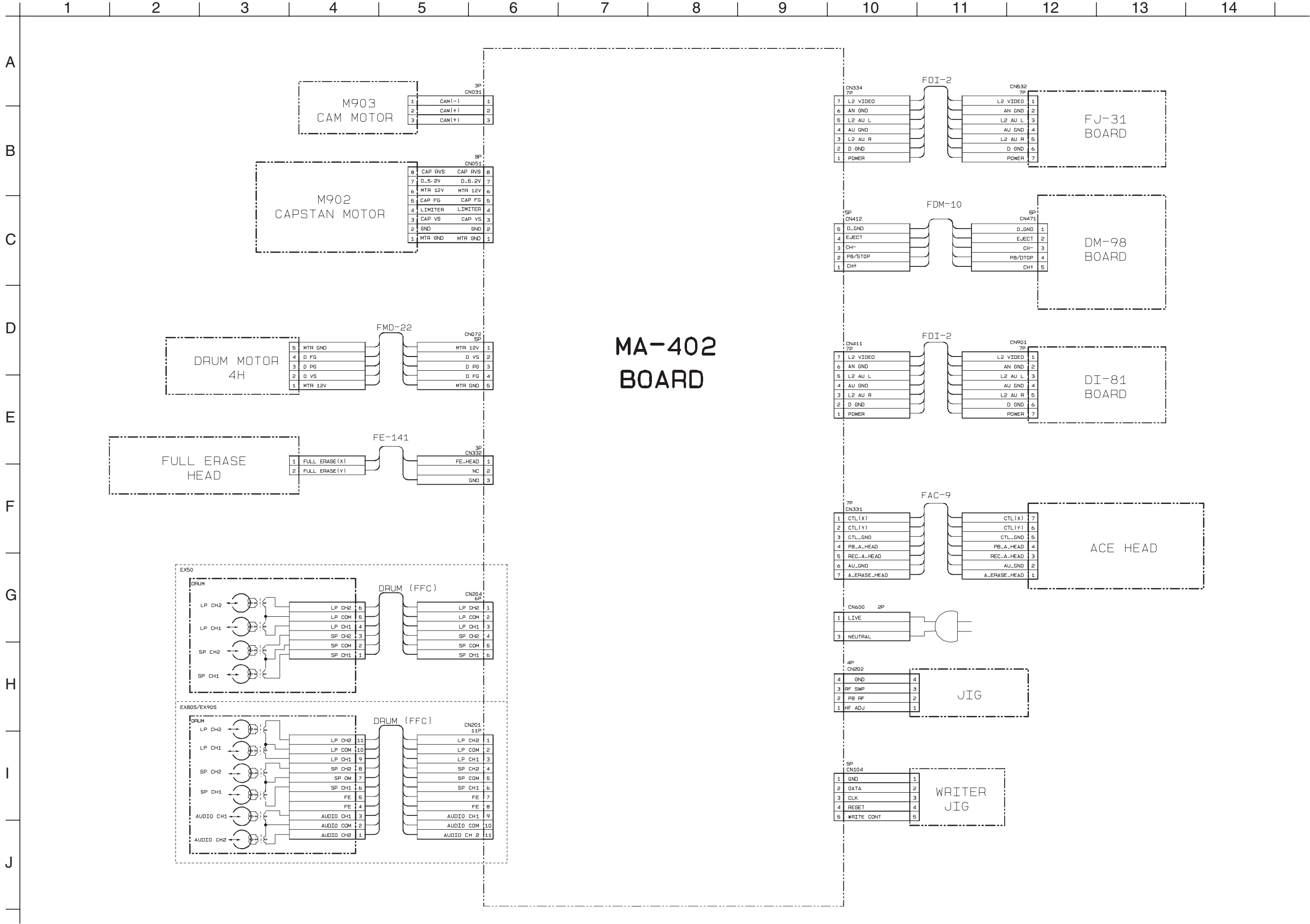


- Constants of resistors, capacitors, ICs and etc with XX indicate that they are not used.  
In such cases, the unused circuits may be indicated.
- Parts with ★ differ according to the model/destination.  
Refer to the mount table for each function.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- Signal name  
XEDIT→ EDIT PB/XREC → PB/REC
-  : non flammable resistor
-  : fusible resistor
-  : panel designation
-  : internal component.
-  : B+ Line.
-  : B- Line.
- Circled numbers refer to waveforms.
- Readings are taken with a color-bar signal input.
- Voltage are dc between ground and measurement points.
- Readings are taken with a digital multimeter (DC10M $\Omega$ ).
- Voltage variations may be noted due to normal production tolerances.
-  : adjustment for repair.
- Circled numbers refer to waveforms.

When indicating parts by reference number, please include the board name.

**Note :**  
The components identified by mark  or dotted line with mark  are critical for safety.  
Replace only with part number specified.

4-1. FRAME SCHEMATIC DIAGRAM

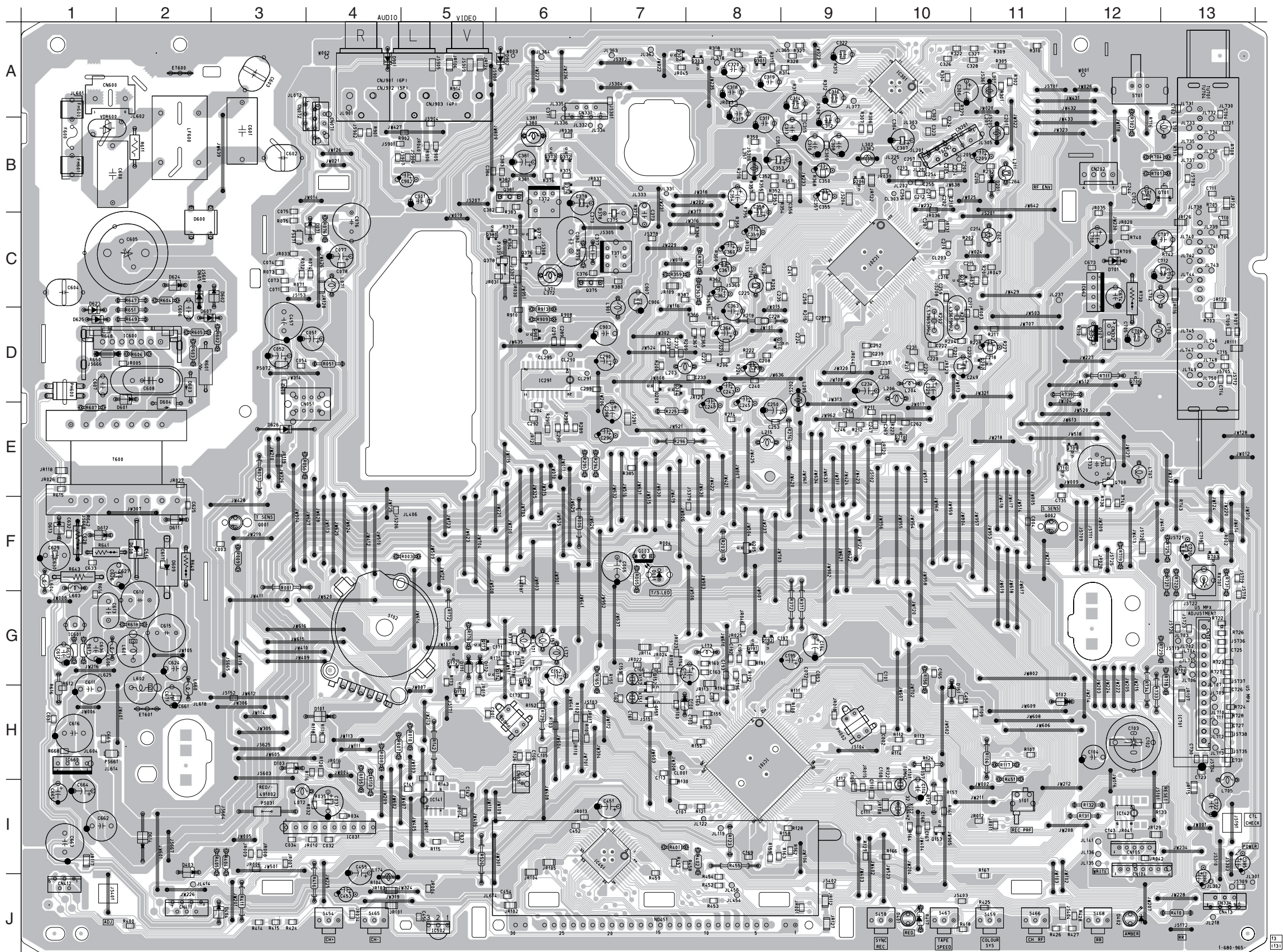


4-6

There are few cases that the part printed on this diagram isn't mounted in this model.

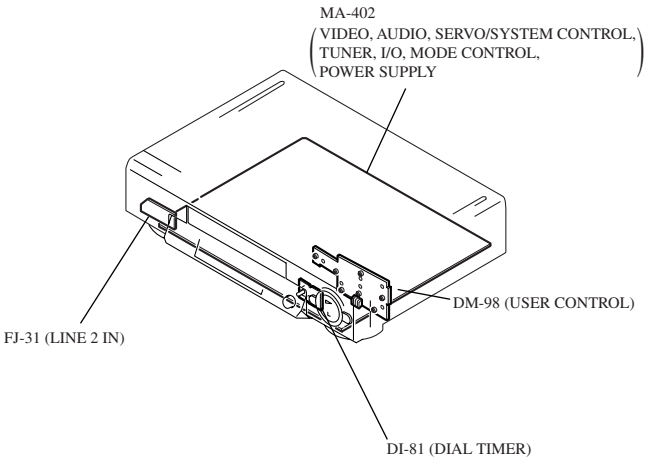
— Ref. No. MA-402 Board:1,000 Series —

MA-402 Board



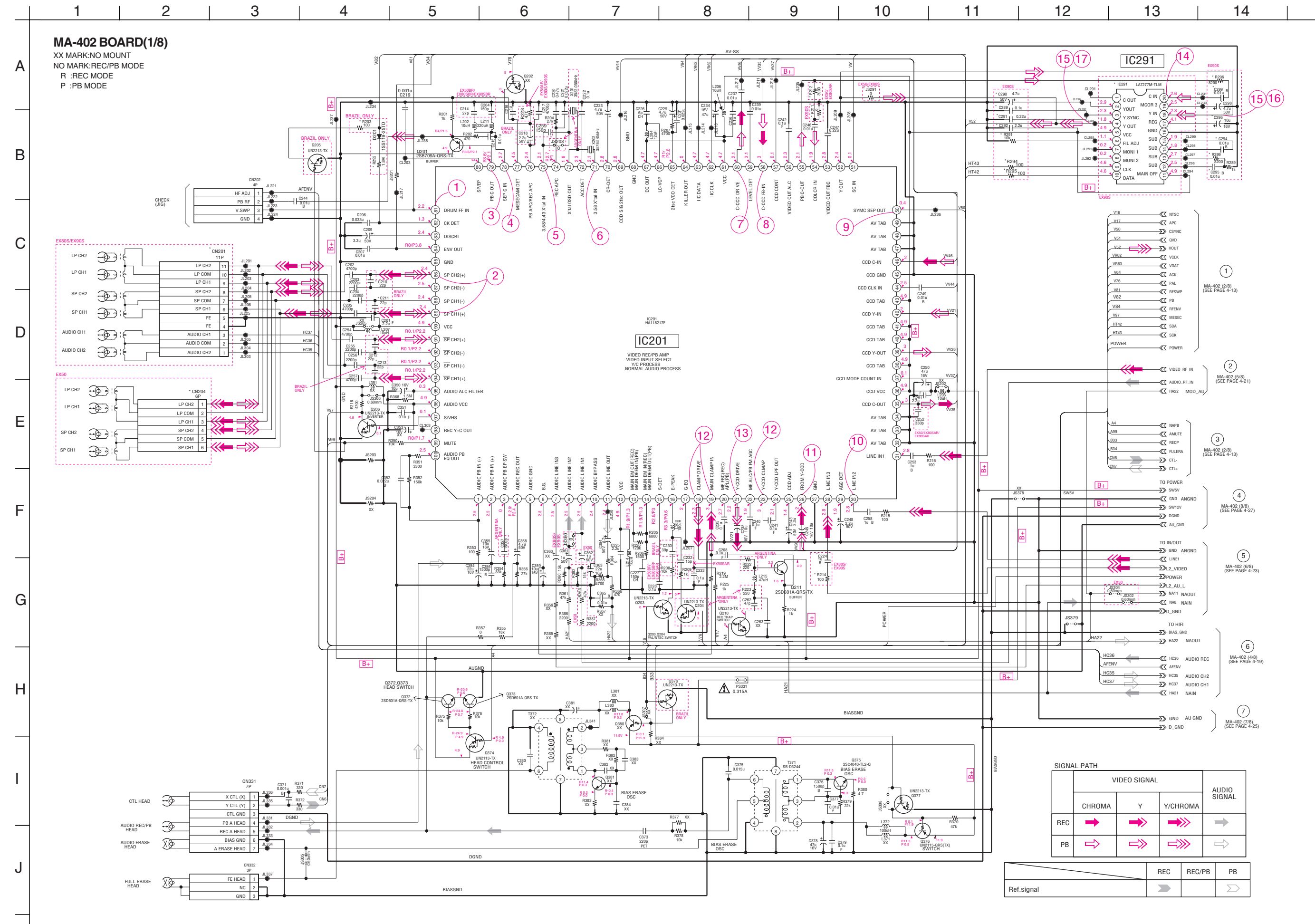
MA-402 BOARD

|       |     |       |     |
|-------|-----|-------|-----|
| CN600 | A1  | IC502 | J5  |
| CN412 | J1  | IC141 | I5  |
| CN411 | J2  | IC291 | D6  |
| CN072 | A3  | IC451 | I7  |
| CN071 | B4  | IC101 | H8  |
| CN051 | E4  | IC201 | C9  |
| CN331 | A6  | IC301 | A10 |
| CN031 | H6  | IC142 | I12 |
| CN201 | B10 | IC662 | C12 |
| CN204 | B10 | IC702 | H13 |
| CN104 | I12 |       |     |
| CN105 | I12 | Q001  | F3  |
| CN332 | D12 | Q380  | C5  |
| CN202 | B12 | Q378  | C5  |
| CN334 | J13 | Q172  | G5  |
| CN413 | J13 | Q171  | H5  |
|       |     | Q373  | B6  |
| D623  | C1  | Q372  | B6  |
| D625  | D1  | Q381  | B6  |
| D613  | F1  | Q374  | B6  |
| D612  | F1  | Q377  | C6  |
| D403  | I2  | Q376  | C6  |
| D614  | I2  | Q901  | D6  |
| D608  | F2  | Q174  | G6  |
| D609  | F2  | Q175  | G6  |
| D611  | F2  | Q151  | H7  |
| D601  | E2  | Q003  | F7  |
| D604  | E2  | Q203  | D7  |
| D603  | D2  | Q204  | D7  |
| D607  | D2  | Q375  | C7  |
| D605  | C2  | Q302  | A7  |
| D624  | C2  | Q303  | A8  |
| D600  | C2  | Q301  | A8  |
| D602  | C3  | Q205  | F8  |
| D626  | E3  | Q192  | G8  |
| D103  | H3  | Q191  | G8  |
| D404  | J3  | Q211  | D8  |
| D901  | A4  | Q206  | B9  |
| D071  | C4  | Q210  | E10 |
| D101  | H4  | Q153  | I10 |
| D171  | G5  | Q201  | C10 |
| D172  | G5  | Q202  | D11 |
| D902  | A6  | Q710  | E11 |
| D001  | F7  | Q701  | D12 |
| D100  | H8  | Q706  | D12 |
| D401  | J10 | Q709  | E12 |
| D151  | H10 | Q708  | E12 |
| D102  | H11 | Q701  | B13 |
| D201  | B11 | Q703  | F13 |
| D701  | C12 | Q704  | G13 |
| IC601 | G1  |       |     |
| IC660 | H1  |       |     |
| IC600 | D2  |       |     |
| IC031 | I4  |       |     |



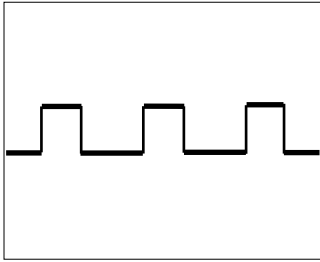
MA-402 (VIDEO, AUDIO) SCHEMATIC DIAGRAM

- Ref. No: MA-402 Board; 1000 series –
- See page 4-5 for printed wiring board.



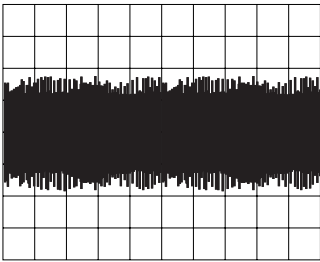
**MA-402 BOARD (1/8)**  
(VIDEO, AUDIO BLOCK)

❶ IC201 ⑥① REC/PB



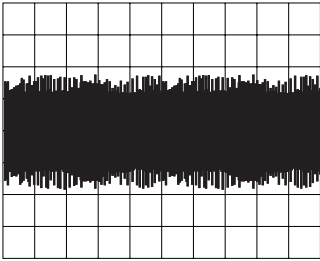
5.3 Vp-p (H)

❷ IC201 ⑥⑤, ⑥⑨ REC



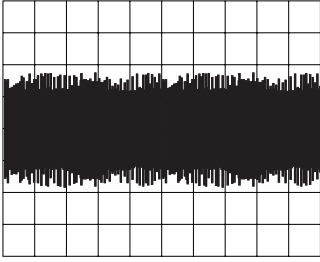
40 mVp-p (H)

❸ IC201 ⑦⑨ PB



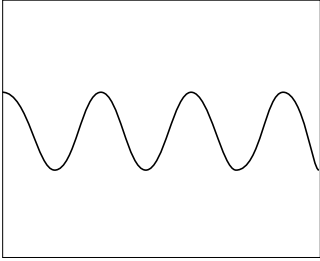
720 mVp-p (H)

❹ IC201 ⑦⑧ PB



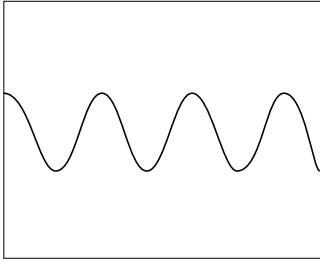
640 mVp-p (H)

❺ IC201 ⑦⑤ REC/PB



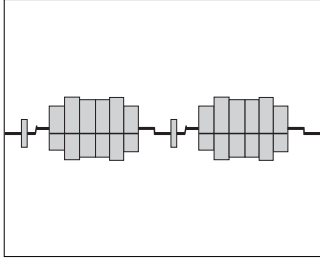
496 mVp-p (4.43 MHz) (PAL)

❻ IC201 ⑦① REC/PB



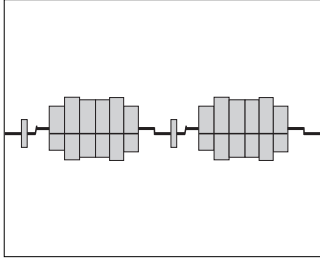
608 mVp-p (3.58 MHz) (NTSC)

❼ IC201 ⑥⑩ REC/PB



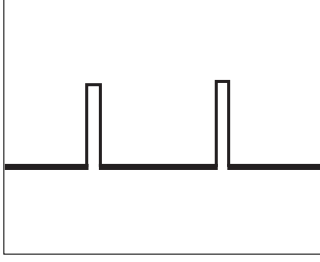
320 mVp-p (H)

❽ IC201 ⑥⑨ REC/PB



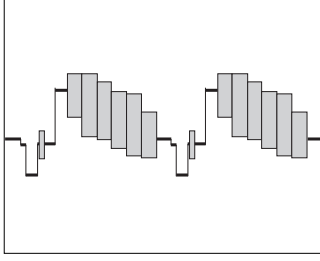
REC: 512 mVp-p (H)  
PB : 584 mVp-p (H)

❾ IC201 ⑥⑩ REC/PB



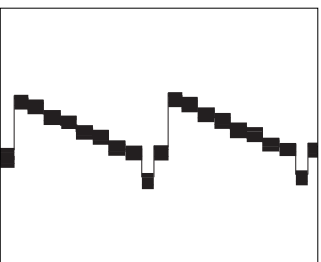
4.6 Vp-p (H)

❿ IC201 ③⑩ REC/PB



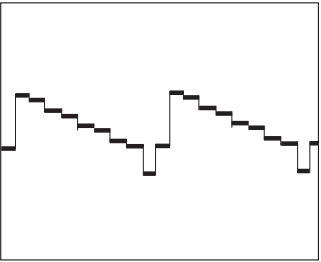
1.1 Vp-p (H)

❶ IC201 ②⑥ REC/PB



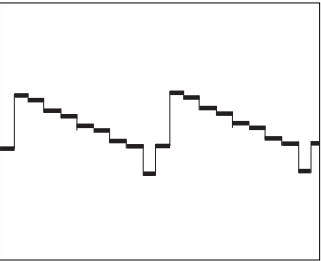
REC: 512 mVp-p (H)  
PB : 584 mVp-p (H)

❷ IC201 ①⑧, ①⑨, ②③ REC/PB



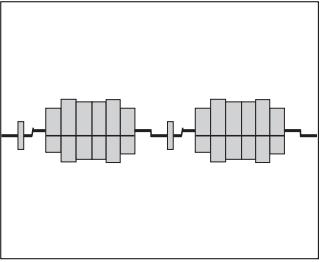
REC: 472 mVp-p (H)  
PB : 504 mVp-p (H)

❸ IC201 ②① REC/PB



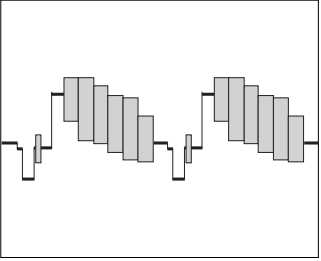
392 mVp-p (H)

❻ IC291 ②⑩ PB



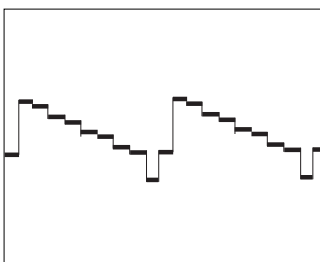
152 mVp-p (H)

❺ IC291 ④, ①⑧ REC



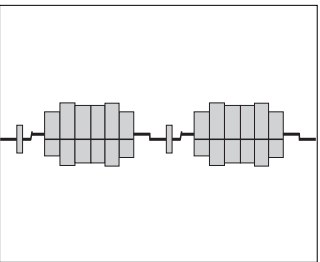
2.1 Vp-p (H)

❶ IC291 ①⑧ PB



1.9 Vp-p (H)

❷ IC291 ④ PB

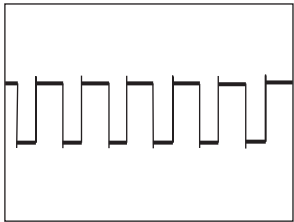


2.2 Vp-p (H)



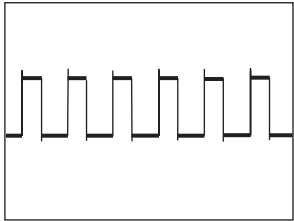
**MA-402 BOARD (2/8)**  
**(SYSTEM CONTROL)**

① IC101 ③ REC



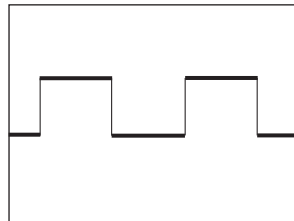
4.64 Vp-p (30Hz)

② IC101 ④ REC



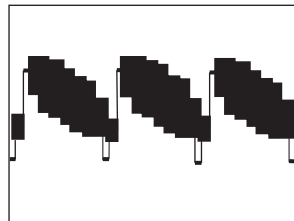
4.64 Vp-p (30Hz)

③ IC101 ⑨ REC/PB



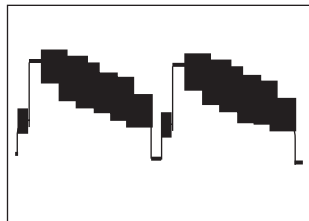
3.8 Vp-p

④ IC101 ⑰ REC/PB



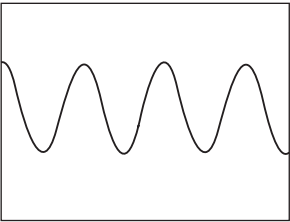
2.36 Vp-p (15.7 KHz)

⑤ IC101 ⑲ REC/PB



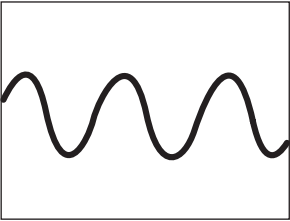
2.16 Vp-p (15.7 KHz)

⑥ IC101 ⑳ REC/PB



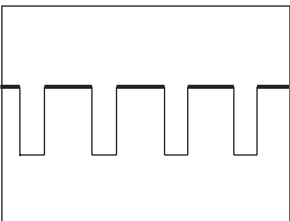
2.6 Vp-p (32.768KHz)

⑦ IC101 ㉑ REC/PB



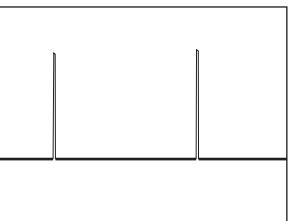
4.3 Vp-p (10MHz)

⑧ IC101 ㉒ REC/PB



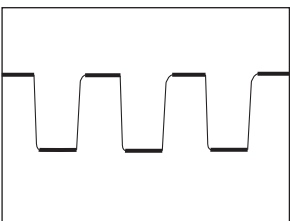
5.0 Vp-p (30Hz)

⑨ IC101 ㉓ REC/PB



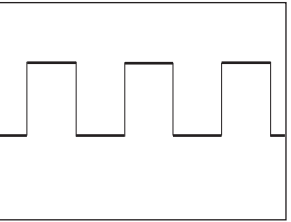
5.0 Vp-p (30Hz)

⑩ IC101 ㉔ REC/PB



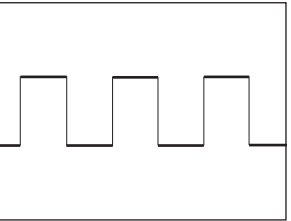
5.0 Vp-p (360Hz)

⑪ IC101 ㉕ REC/PB



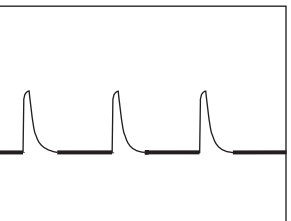
5.0 Vp-p (30Hz)

⑫ IC101 ㉖ REC/PB



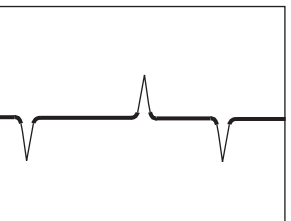
5.0 Vp-p (30Hz)

⑬ IC101 ㉗ REC/PB



4.3 Vp-p (15.7KHz)

⑭ JL 192 PB



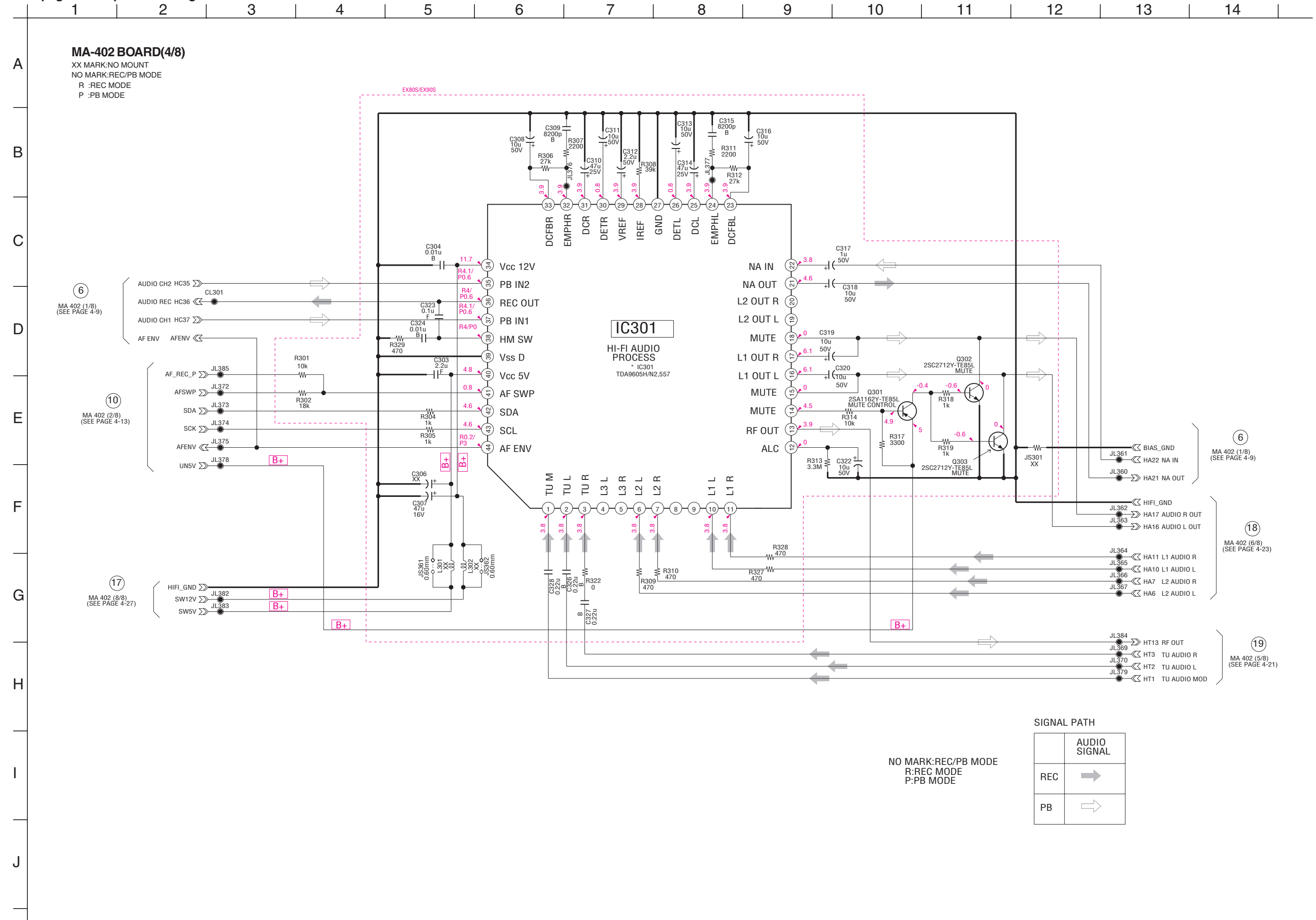
4.64 Vp-p (30Hz)



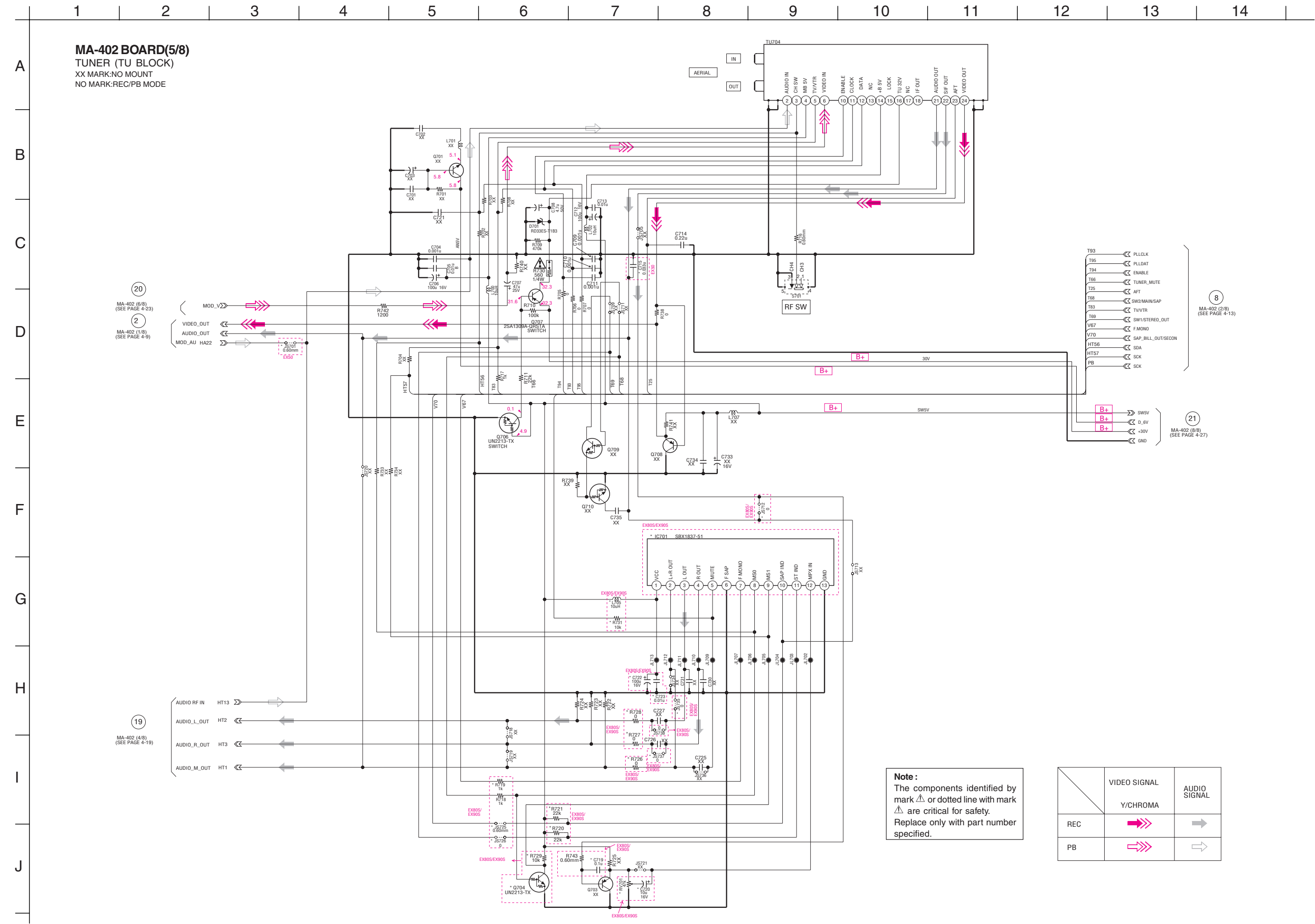
## MA-402 (Hi-Fi AUDIO) SCHEMATIC DIAGRAM

– Ref. No: MA-402 Board; 1000 series –

- See page 4-5 for printed wiring board.

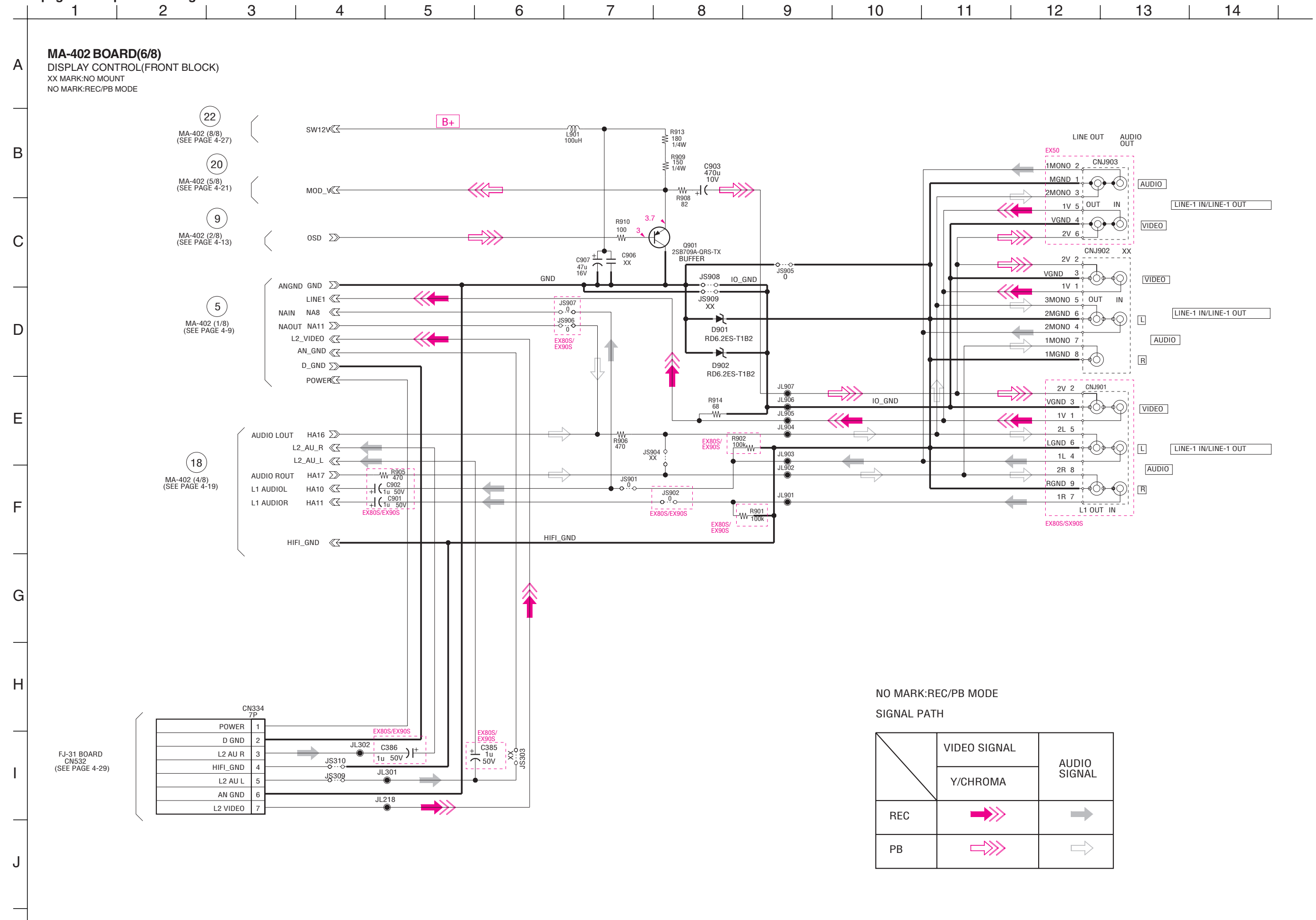


MA-402 (TUNER) SCHEMATIC DIAGRAM  
– Ref. No: MA-402 Board; 1000 series –  
• See page 4-5 for printed wiring board.



– Ref. No: MA-402 Board; 1000 series –

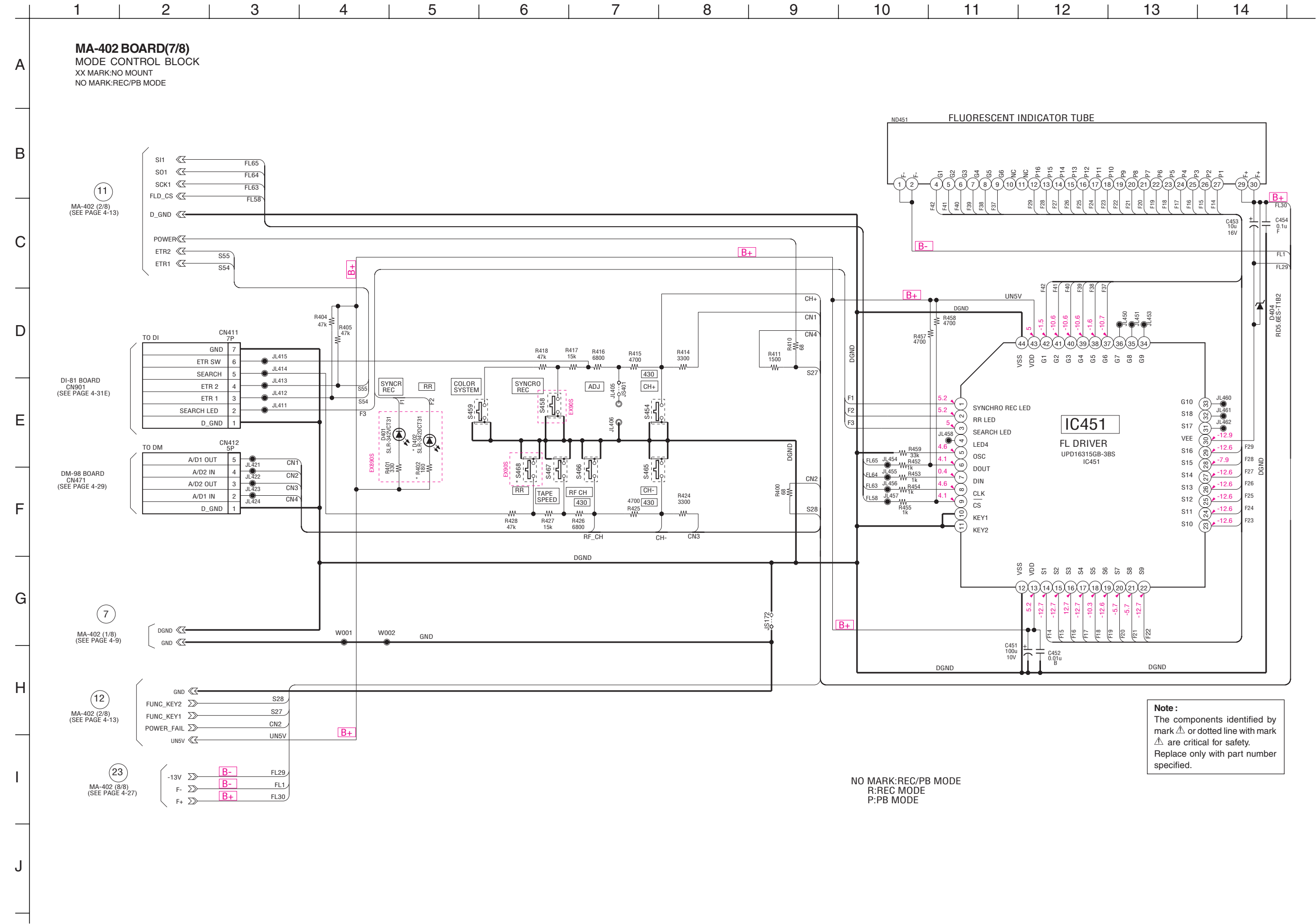
- See page 4-5 for printed wiring board.



| NO MARK:REC/PB MODE |                                                                                       |                                                                                       |
|---------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| SIGNAL PATH         |                                                                                       |                                                                                       |
|                     | VIDEO SIGNAL                                                                          | AUDIO SIGNAL                                                                          |
|                     | Y/CHROMA                                                                              |                                                                                       |
| REC                 |  |  |
| PB                  |  |  |

MA-402 (MODE CONTROL) SCHEMATIC DIAGRAM

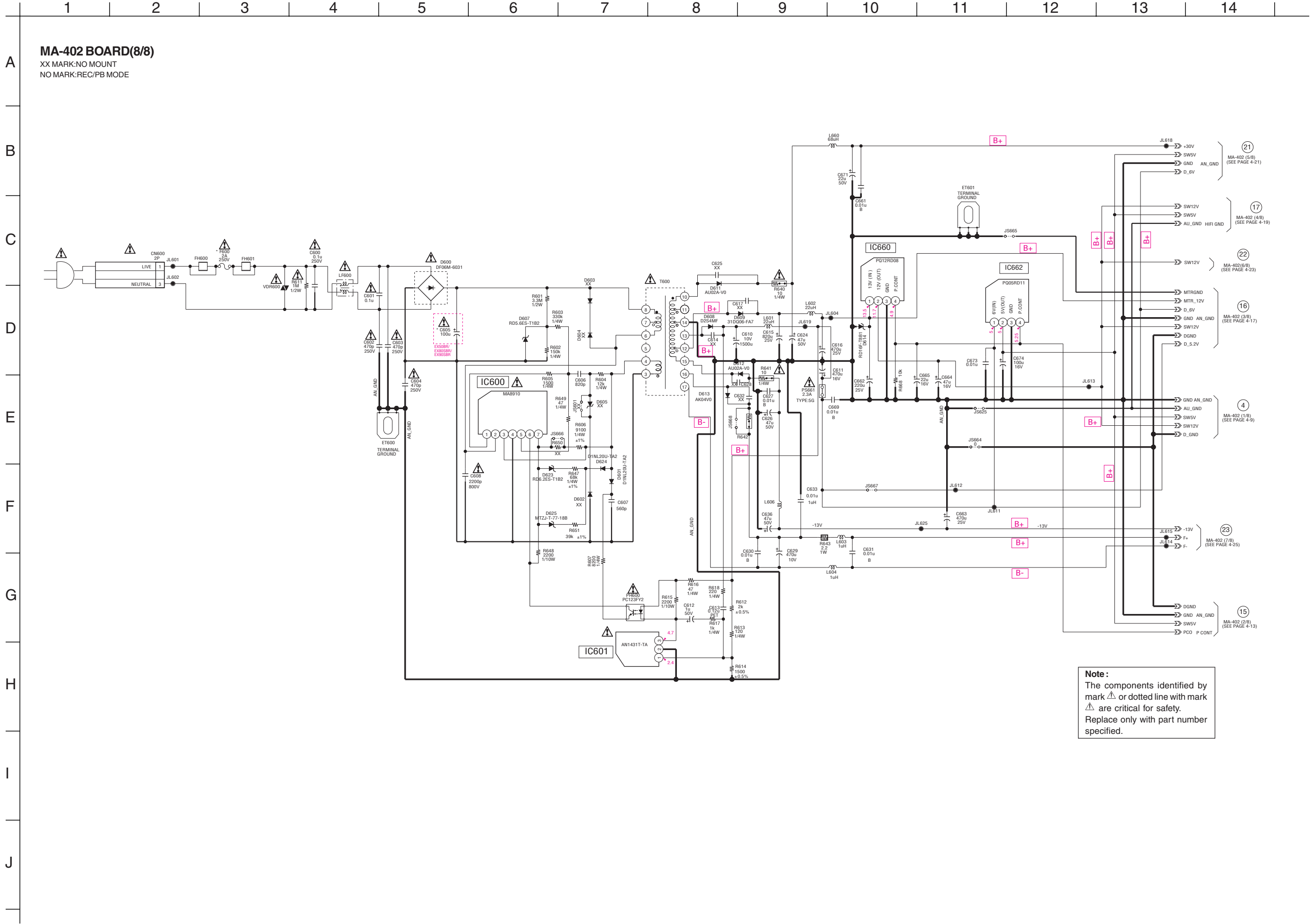
- Ref. No: MA-402 Board; 1000 series -
- See page 4-5 for printed wiring board.



MA-402 (POWER SUPPLY) SCHEMATIC DIAGRAM

– Ref. No: MA-402 Board; 1000 series –

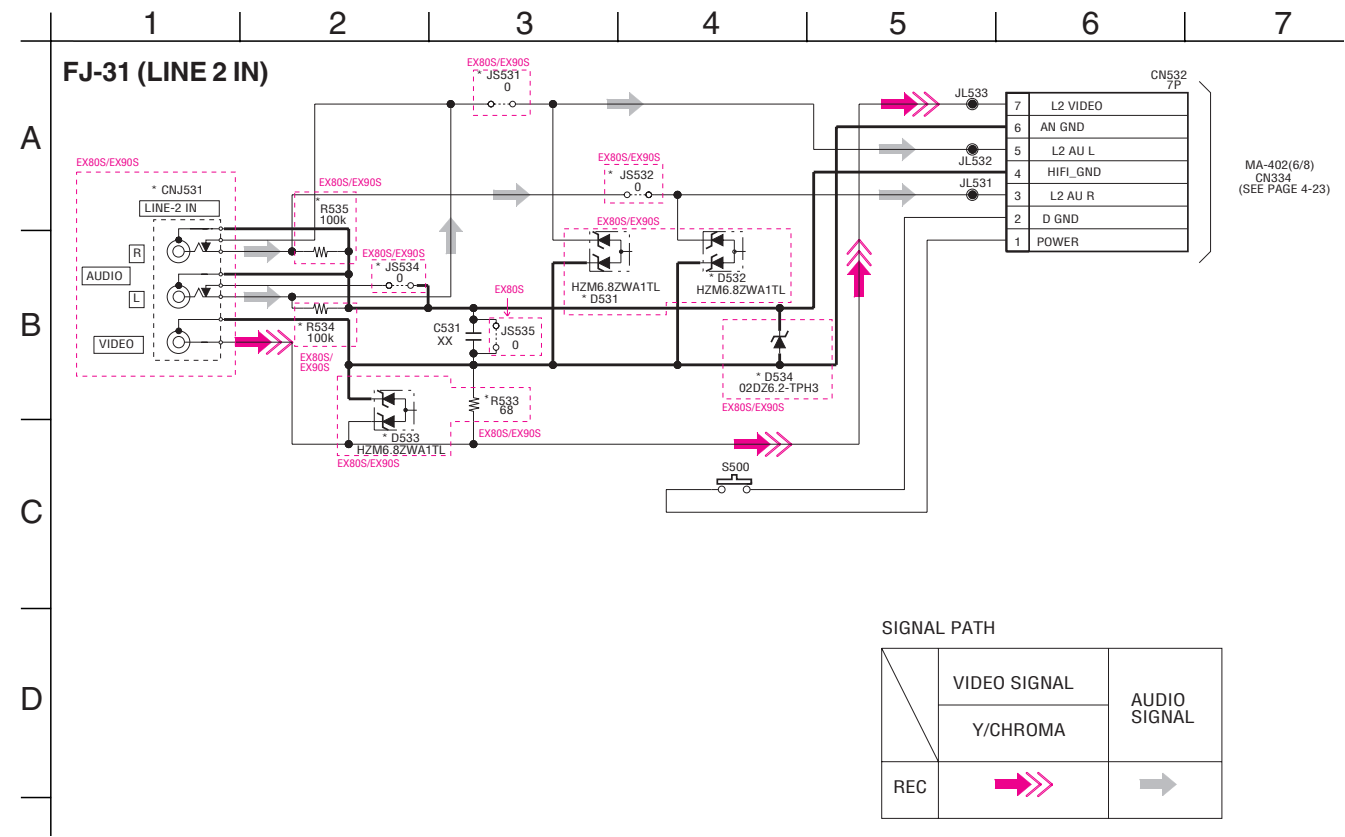
• See page 4-5 for printed wiring board.



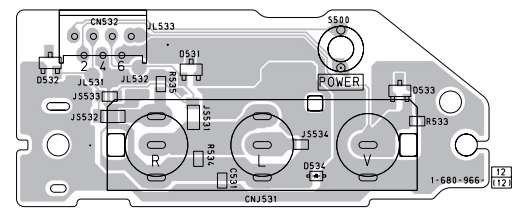
SLV - EX50/EX80S/EX90S

FJ-31 (LINE 2 IN) AND DM-98 (FUNCTION) PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

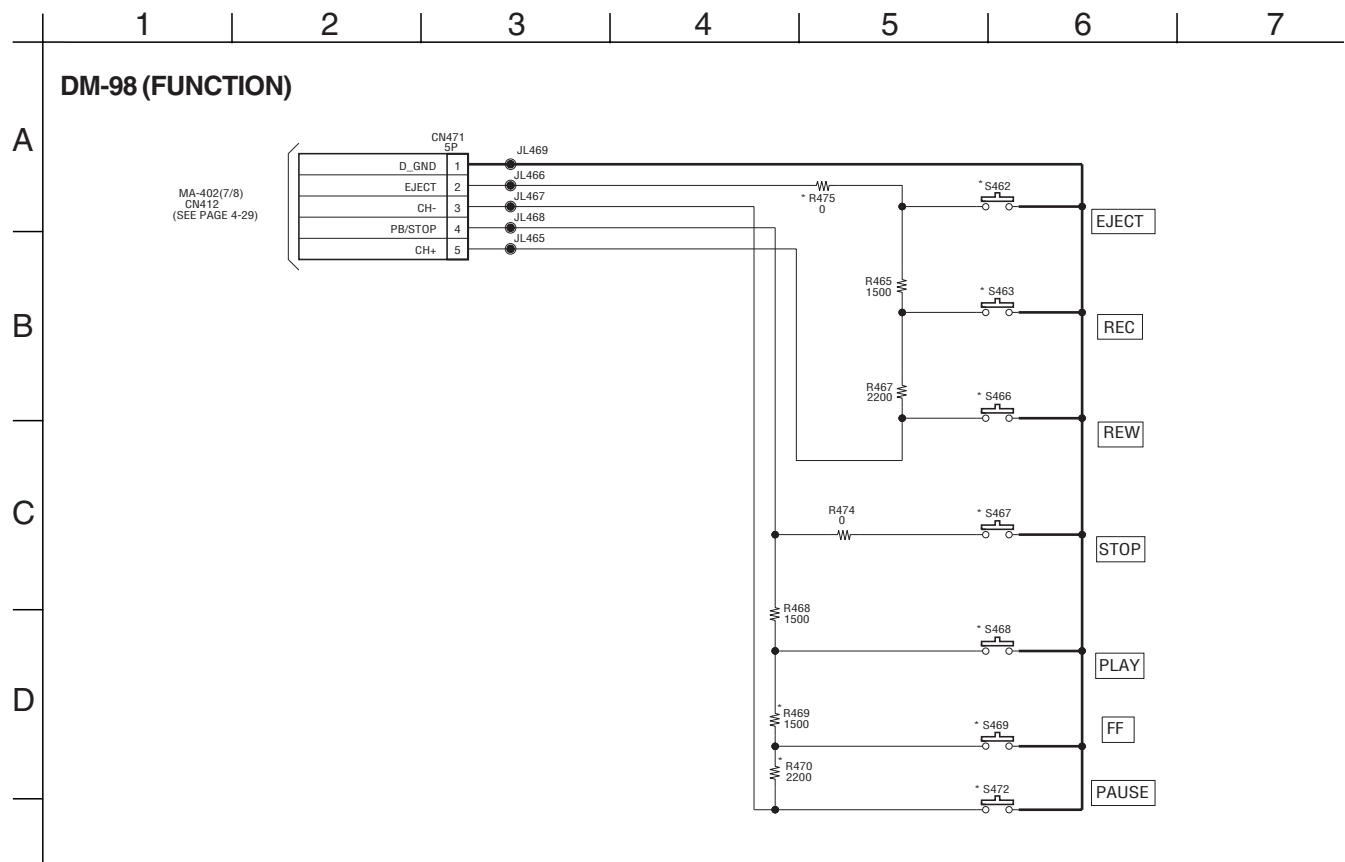
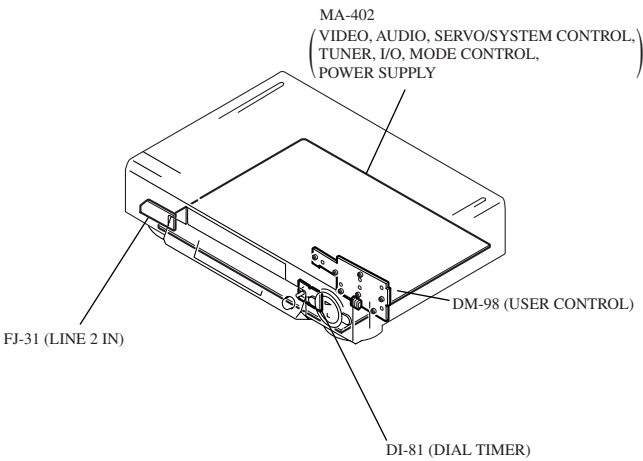
— Ref. No. FJ-31 Board:1,000 Series —  
— SLV-ED212/ED717/ED818/ED919 —  
— Ref. No. DM-98 Board:2,000 Series —



FJ-31 BOARD



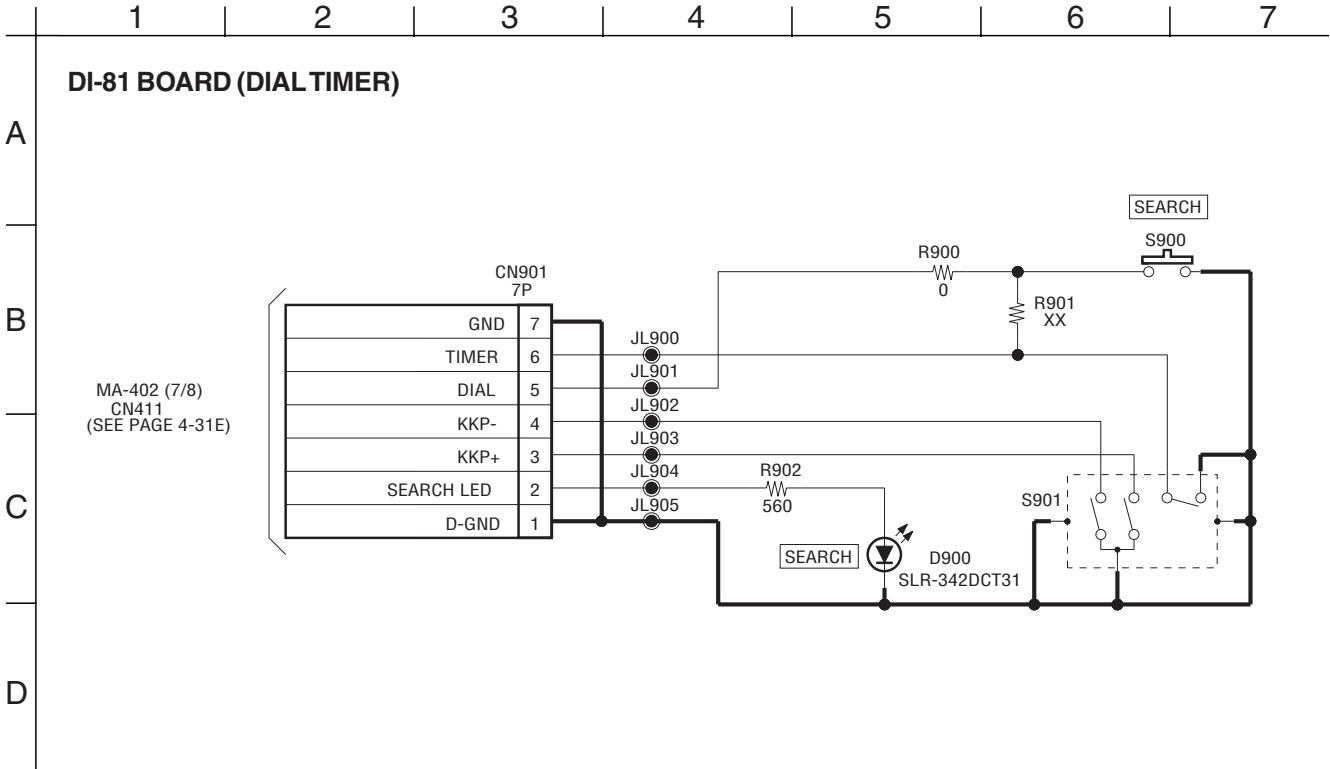
There are few cases that the part printed on this diagram isn't mounted in this model.



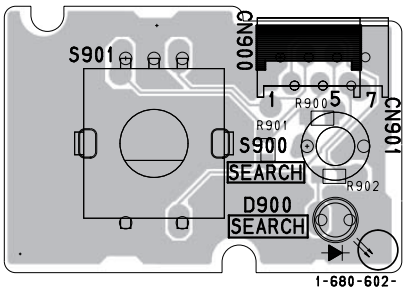
DI-81 (DIAL TIMER) PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM

— Ref. No. DI-81 Board:2,000 Series —

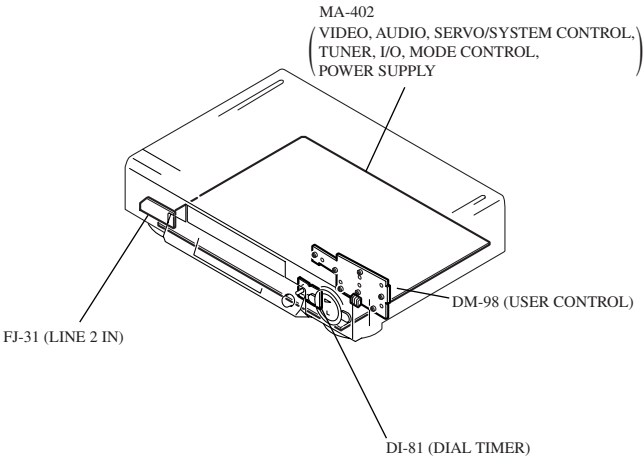
There are few cases that the part printed on this diagram isn't mounted in this model.



DI-81 BOARD



1-680-602-



# SECTION 5 INTERFACE, IC PIN FUNCTION DESCRIPTION

## 5-1. SYSTEM CONTROL – VIDEO BLOCK INTERFACE (MA-402 BOARD IC101)

| Signal | Pin No.                          | I/O | STOP/<br>FF/REW | TAPE<br>THREADING | TAPE<br>UNTHREAD-<br>ING | PB | PB •<br>PAUSE | SLOW | x 2 | CUE | REVIEW | RECORD | REC •<br>PAUSE |
|--------|----------------------------------|-----|-----------------|-------------------|--------------------------|----|---------------|------|-----|-----|--------|--------|----------------|
| RF SWP | MA-402<br>IC101 <sup>(105)</sup> | O   | *1              | *1                | *1                       | *1 | *1            | *1   | *1  | *1  | *1     | *1     | *1             |
| QVD    | MA-402<br>IC101 <sup>(109)</sup> | O   | L               | L                 | L                        | *2 | *3            | *3   | *3  | *3  | *3     | *3     | *3             |
| C SYNC | MA-402<br>IC101 <sup>(111)</sup> | I   | *4              | *4                | *4                       | *4 | *4            | *4   | *4  | *4  | *4     | *4     | *4             |

\*1 25 Hz pulse with 50% duty cycle. Synchronized with rotation of drum.

\*2 Normal PB “L”. V period “H” pulse when x1.

\*3 V period “H” pulse.

\*4 Composite sync signal (positive polarity).

## 5-2. SYSTEM CONTROL – SERVO PERIPHERAL CIRCUIT INTERFACE (MA-402 BOARD IC101)

| Signal   | Pin No.                          | I/O | STOP | FF   | REW  | TAPE<br>THREADING | TAPE<br>UNTHREAD-<br>ING | PB   | PB •<br>PAUSE | SLOW | x 2  | CUE  | REVIEW | RECORD | REC •<br>PAUSE |
|----------|----------------------------------|-----|------|------|------|-------------------|--------------------------|------|---------------|------|------|------|--------|--------|----------------|
| CAP QR   | MA-402<br>IC101 <sup>(91)</sup>  | O   | Hi-Z | Hi-Z | Hi-Z | Hi-Z              | Hi-Z                     | Hi-Z | Hi-Z          | *2   | Hi-Z | Hi-Z | Hi-Z   | Hi-Z   | Hi-Z           |
| DRUM PG  | MA-402<br>IC101 <sup>(104)</sup> | I   | *3   | *1   | *1   | *4                | *4                       | *1   | *1            | *1   | *1   | *1   | *1     | *1     | *1             |
| DRUM FG  | MA-402<br>IC101 <sup>(103)</sup> | I   | *3   | *6   | *6   | *4                | *4                       | *6   | *6            | *6   | *6   | *6   | *6     | *6     | *6             |
| CAP FG   | MA-402<br>IC101 <sup>(9)</sup>   | I   | H/L  | *5   | *5   | *4                | *4                       | *5   | H/L           | *5   | *5   | *5   | *5     | *5     | H/L            |
| CAP PWM  | MA-402<br>IC101 <sup>(108)</sup> | O   | *7   | *7   | *7   | *7                | *7                       | *8   | *7            | *7   | *8   | *8   | *8     | *8     | *7             |
| DRUM PWM | MA-402<br>IC101 <sup>(107)</sup> | O   | *9   | *9   | *9   | *9                | *9                       | *9   | *9            | *9   | *9   | *9   | *9     | *9     | *9             |

\*1. 25 Hz (PAL), 30 Hz (NTSC) pulse.

\*2. Pulse at tape running.

\*3. “L” when drum rotation stop.

\*4. Unstable period pulse.

\*5. Pulse of period in proportion to tape speed.

\*6. 300 Hz (PAL), 360 Hz (NTSC) pulse.

\*7. Pulse at tape running.

\*8. Approx. 2 msec period “H” or “L” pulse.

\*9. Approx. 1.5 msec period “H” or “L” pulse.

### 5-3. SYSTEM CONTROL – MECHANISM BLOCK INTERFACE (MA-402 BOARD IC101)

| Signal  | Pin No.                         | I/O        | EJECTED | CASSETTE<br>LOADING | CASSETTE<br>UNLOADING | TAPE<br>THREAD-<br>ING | TAPE<br>UNTHREAD-<br>ING | STOP | FF | REW | PB | PB<br>PAUSE | SLOW | x 2 | CUE | REVIEW | REC | REC •<br>PAUSE |
|---------|---------------------------------|------------|---------|---------------------|-----------------------|------------------------|--------------------------|------|----|-----|----|-------------|------|-----|-----|--------|-----|----------------|
| CAM     | MA-402<br>IC101 <sup>(45)</sup> | O          | Hi-Z    | H                   | L                     | H                      | L                        | H    | *7 | *7  | *7 | *7          | *7   | *7  | *7  | *7     | *7  | *7             |
| MODE 1  | MA-402<br>IC101 <sup>(37)</sup> | I          | H       | L                   | L                     | *1                     | *1                       | L    | H  | H   | H  | H           | H    | H   | H   | L      | H   | H              |
| MODE 2  | MA-402<br>IC101 <sup>(38)</sup> | I          | H       | L                   | L                     | *1                     | *1                       | L    | H  | H   | H  | H           | H    | L   | L   | L      | L   | L              |
| MODE 3  | MA-402<br>IC101 <sup>(39)</sup> | I          | L       | L                   | L                     | *1                     | *1                       | L    | L  | L   | L  | L           | L    | L   | L   | H      | L   | L              |
| MODE 4  | MA-402<br>IC101 <sup>(40)</sup> | I          | L       | H                   | H                     | *1                     | *1                       | H    | H  | H   | H  | H           | H    | L   | L   | L      | L   | L              |
| REC PRF | MA-402<br>IC101 <sup>(36)</sup> | I          | H       | *2                  | *2                    | *2                     | *2                       | *2   | *2 | *2  | *2 | *2          | *2   | *2  | *2  | *2     | *2  | *2             |
| T REEL  | MA-402<br>IC101 <sup>(42)</sup> | I          | H/L     | H/L                 | H/L                   | H/L                    | H/L                      | H/L  | *3 | *3  | *3 | H/L         | *3   | *3  | *3  | *3     | *3  | H/L            |
| S REEL  | MA-402<br>IC101 <sup>(41)</sup> | I          | H/L     | H/L                 | H/L                   | *3                     | *3                       | H/L  | *3 | *3  | *3 | H/L         | *3   | *3  | *3  | *3     | *3  | H/L            |
| END-LED | MA-402<br>IC101 <sup>(49)</sup> | O<br>(O.D) | *4      | *4                  | *4                    | *4                     | *4                       | *4   | *4 | *4  | *4 | *4          | *4   | *4  | *4  | *4     | *4  | *4             |
| CAP PVS | MA-402<br>IC101 <sup>(30)</sup> | I          | L       |                     |                       | H                      | L                        | H/L  | H  | L   | H  | H           | H    | H   | H   | L      | H   | H              |
| T SENS  | MA-402<br>IC101 <sup>(33)</sup> | I          | *4      | *4                  | *4                    | *6                     | *6                       | *4   | *6 | *6  | *6 | *6          | *6   | *6  | *6  | *6     | *6  | *6             |
| S SENS  | MA-402<br>IC101 <sup>(32)</sup> | I          | *4      | *4                  | *4                    | *6                     | *6                       | *4   | *6 | *6  | *6 | *6          | *6   | *6  | *6  | *6     | *6  | *6             |

\*1. Uncertainty.

\*2. "L" when erasing protection tab is bent, "H" when not bent.

\*3. Pulse of period in proportion to reel rotating speed.

\*4. Approx.2 msec period "H" pulse.

\*5. Pulse at tape running.

\*6. Normally "L". 2 msec period "H" pulse when tape top or tape end is detected.

\*7. When transition to UNLOADING direction: L.

When Transition to LOADING direction: H.

When CAM motor is stopped: Hi-Z.

#### 5-4. SYSTEM CONTROL – AUDIO BLOCK INTERFACE (MA-402 BOARD IC101)

| Signal     | Pin No.                          | I/O        | STOP/<br>FF/<br>REW                                          | TAPE<br>THREAD-<br>ING | TAPE<br>UNTHREAD-<br>ING | PB   | PB •<br>PAUSE | SLOW | x 2 | CUE | REVIEW | REC | REC •<br>PAUSE |
|------------|----------------------------------|------------|--------------------------------------------------------------|------------------------|--------------------------|------|---------------|------|-----|-----|--------|-----|----------------|
| AU RF      | MA-402<br>IC101 <sup>(35)</sup>  | O          | AF RF envelope signal input terminal for automatic tracking. |                        |                          |      |               |      |     |     |        |     |                |
| A MUTE     | MA-402<br>IC101 <sup>(89)</sup>  | O<br>(O.D) | Hi-Z                                                         | Hi-Z                   | Hi-Z                     | Hi-Z | H             | H    | H   | H   | H      | H   | H              |
| AF SWP     | MA-402<br>IC101 <sup>(106)</sup> | O          | *1                                                           | *1                     | *1                       | *1   | *1            | *1   | *1  | *1  | *1     | *1  | *1             |
| FULL ERASE | MA-402<br>IC101 <sup>(71)</sup>  | O<br>(O.D) | H                                                            | H                      | H                        | H    | H             | H    | H   | H   | H      | L   | H              |
| REC P      | MA-402<br>IC101 <sup>(72)</sup>  | O          | L                                                            | L                      | L                        | L    | L             | L    | L   | L   | L      | H   | L              |
| NAPB       | MA-402<br>IC101 <sup>(96)</sup>  | O          | L                                                            | L                      | L                        | L    | L             | L    | L   | L   | L      | H   | L              |

\*1. 25Hz (PAL), 30Hz (NTSC) 50% duty pulse approx. 5 msec delayed from RF SW P.

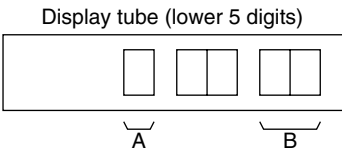
## 5-5. SERVO/SYSTEM CONTROL, OSD MICROPROCESSOR PIN FUNCTION (MA-402 BOARD IC101)

| Pin No. | Pin Name           | I/O | Function                                   |
|---------|--------------------|-----|--------------------------------------------|
| 1       | VSS (SERVO)        | –   | Servo ground                               |
| 2       | AN GND             | –   | Analog ground                              |
| 3       | CTL(+)             | I/O | CTL Head signal input/output (REC mode)    |
| 4       | CTL (–)            | I/O | CTL Head signal input/output (REC mode)    |
| 5       | CTL-BIAS           | I   | CTL amp. control signal input (gain set)   |
| 6       | CTL-FB             | I   | CTL amp. control signal input (gain set)   |
| 7       | CTL-AMP(O)         | O   | CTL amp. control signal input (for check)  |
| 8       | CTL-SMT            | I   | CTL amp. control signal input (gain set)   |
| 9       | CAP FG             | I   | Capstan FG schmitt input                   |
| 10      | VCC (SERVO)        | –   | Power supply unswitch 5V                   |
| 11      | AFC PC             | I/O | AFC oscillation signal                     |
| 12      | AFC OSC            | I/O | AFC oscillation signal                     |
| 13      | AFCLPF             | I/O | AFC LPF signal                             |
| 14      | CSYNC              | I/O | Sync input                                 |
| 15      | VLPF               | I   | VLPF input                                 |
| 16      | C V IN 2           | I   | Composite video signal input 2             |
| 17      | C V IN 1           | I   | Composite video signal input 1             |
| 18      | OSDVSS             |     | Power supply OSD 5V                        |
| 19      | VIDEO OUT (CV OUT) | O   | Composite video signal output              |
| 20      | OSD VSS            | –   | OSD ground                                 |
| 21      | 4FSC OUT           | O   | OSC 4fsc oscillator terminal signal output |
| 22      | 4Fisc IN           | I   | OSC 4fsc oscillator terminal signal input  |
| 23      | AVSS               | –   | Analog ground                              |
| 24      | APC Error          | I   | APC error voltage signal input             |
| 25      | TU AFT             | I   | Auto tuning signal input                   |
| 26      | FUNCTION Key 2     | I   | Function key analog voltage signal input 2 |
| 27      | FUNCTION Key 1     | I   | Function key analog voltage signal input 2 |
| 28      | POWER FAIL         | I   | Power failure detect signal input          |
| 29      | DEST 1             | I   | Destination set signal input 1             |
| 30      | PB                 | –   | Not used                                   |
| 31      | DEST 2             | I   | Destination set signal input 2             |
| 32      | T SENS             | I   | Take up end sensor signal input            |
| 33      | S SENS             | I   | Supply end sensor signal input             |
| 34      | VIDEO RF           | I   | Video RF envelope signal                   |
| 35      | AUDIO RF           | I   | Audio RF envelope signal                   |
| 36      | AVCC               | –   | Analog power supply                        |
| 37      | MODE1              | I   | Mechanism Section CAM encoder data input 1 |
| 38      | MODE2              | I   | Mechanism Section CAM encoder data input 2 |
| 39      | MODE3              | I   | Mechanism Section CAM encoder data input 3 |
| 40      | MODE4              | I   | Mechanism Section CAM encoder data input 4 |
| 41      | S REEL             | I   | S side reel FG input                       |
| 42      | T REEL             | I   | T side reel FG input                       |
| 43      | REMOCON            | I   | Remote Control (SIRCS) signal input        |
| 44      | CTL-OSD            | I/O | CTL amp. signal input/output (OSD)         |
| 45      | CAM                | O   | CAM motor signal output                    |
| 46      | SAT SYNC LED       | –   | Not used                                   |
| 47      | RR LED             | –   | Not used                                   |
| 48      | SEARCH LED         | –   | Not used                                   |
| 49      | END LED            | O   | Top/end LED on/off control signal output   |
| 50      | POWER CONT         | O   | Power supply control signal output         |
| 51      | WRITE CONT         | O   | EEP ROM write timing control signal output |
| 52      | BLUE BACK          | O   | OSD block control output                   |
| 53      | AUDIO DUB          | O   | To 'on' the audio dub filter               |
| 54      | ETR 1              | I   | Easy Timer knob pulse 1 signal input       |
| 55      | ETR 2              | I   | Easy Timer knob pulse 2 signal input       |
| 56      | VCC                | I   | Power supply                               |

| Pin No. | Pin Name           | I/O | Function                                                   |
|---------|--------------------|-----|------------------------------------------------------------|
| 57      | VSS                | –   | Ground                                                     |
| 58      | FLD VSS            | –   | FLD ground                                                 |
| 59      | SCL0               | I/O | Clock signal input/output                                  |
| 60      | SDA0               | I/O | Data input/output for IIC                                  |
| 61      | SCL1               | I/O | Clock input/output for IIC bus interface                   |
| 62      | SDA1               | I/O | Data input/output for IIC bus interface                    |
| 63      | SCK1               | I/O | SCI clock input/output                                     |
| 64      | SO1                | O   | Serial communication data signal output                    |
| 65      | SI1                | I   | Serial communication data signal input                     |
| 66      | TA MUTE            | O   | Tuner audio mute                                           |
| 67      | F MONO             | O   | Force mono                                                 |
| 68      | MAIN SAP           | O   | Bilingual select                                           |
| 69      | STEREO OUT         | O   | Stereo/mono control                                        |
| 70      | SECAM ON           | –   | Not used (only for secam model)                            |
| 71      | FULL ERASE         | O   | Full erase head on/off control signal                      |
| 72      | REC P              | O   | "L" : output when REC pause                                |
| 73      | IN SELECT          | O   | Line-input selection control signal output                 |
| 74      | FLASH WRITE ENABLE | I   | Enables flash write                                        |
| 75      | 32KHZ (OUT)        | O   | Timer clock terminal (32khz) output                        |
| 76      | 32KHZ (IN)         | I   | Timer clock terminal (32khz) input                         |
| 77      | RESET              | I   | Reset signal output                                        |
| 78      | 10MHZ (IN)         | I   | System clock terminal (10MHz) input                        |
| 79      | VSS                | –   | Ground                                                     |
| 80      | 10MHZ (OUT)        | O   | System clock terminal (10MHz) input                        |
| 81      | CAP CONNET TO VSS  | –   | Smoothing capacitor connection                             |
| 82      | MDO                | I   | Sets operating mode                                        |
| 83      | TV/VTR             | –   | Not used                                                   |
| 84      | APC PWM            | O   | APC PWM signal output                                      |
| 85      | CAP TRQ PWM        | O   | Capstan TRQ PWM signal output                              |
| 86      | REC PROOF          | I   | Erasing protection tab. Cassette in detection signal input |
| 87      | NIL                | –   | Not used                                                   |
| 88      | NIL                | –   | Not used                                                   |
| 89      | A MUTE             | O   | "H" : audio mute signal output                             |
| 90      | CAP RVS            | O   | Capstan reverse control signal "H": when reverse           |
| 91      | CAP QR             | O   | Capstan step driving signal output                         |
| 92      | DRUM QR            | O   | Drum motor step driving signal output                      |
| 93      | PLL CLOCK          | O   | Tuner PLL clock signal output                              |
| 94      | TU ENABLE          | O   | Tuner PLL chip select signal output                        |
| 95      | PLL DATA           | O   | Tuner PLL data signal output                               |
| 96      | NA PB              | O   | Normal audio PB signal output                              |
| 97      | AF REC P           | O   | "L": output when Hi-Fi audio REC pause (not used)          |
| 98      | EX CTL             | –   | Not used                                                   |
| 99      | SECAM DET          | –   | Not used                                                   |
| 100     | C. KILLER DET      | I   | To detect type of color system                             |
| 101     | HEAD CLOG LED      | –   | Not used                                                   |
| 102     | MESECAM DET        | I   | To detect mesecam signal                                   |
| 103     | DRUM PG            | I   | Drum FG schmitt amp. input                                 |
| 104     | DRUM FG            | I   | Drum FG schmitt amp. put                                   |
| 105     | RF SWP             | O   | RF switching pulse signal output                           |
| 106     | AF SWP             | O   | AF switching pulse signal output                           |
| 107     | DRUM PWM           | O   | Drum motor error signal output                             |
| 108     | CAP PWM            | O   | Capstan error signal output                                |
| 109     | QVD                | O   | Quasi VD pulse signal output                               |
| 110     | VSS                | –   | Ground                                                     |
| 111     | CSYNC              | I   | Composite sync signal input                                |
| 112     | VCC                | –   | Power supply unswitch 5V                                   |

SECTION 6  
ERROR CODE

This set displays an error code, and a mode code in case of error on the display tube, if the operation stopped by error. The following provides description concerned.



A: Error code ..... Table 6-1  
B: Mode code in case of error ..... Table 6-2

These codes are displayed at lower 5-digit positions of display tube.  
In this case, “ : ” between digits is not displayed.

Table 6-1. Error Codes

| Code | Description                         |
|------|-------------------------------------|
| 0    | NO ERROR                            |
| 1    | CAM ENCODER ERROR, LOAD DIRECTION   |
| 2    | CAM ENCODER ERROR, UNLOAD DIRECTION |
| 3    | T REEL ERROR                        |
| 4    | S REEL ERROR                        |
| 5    | CAPSTAN ERROR                       |
| 6    | DRUM ERROR                          |
| 7    | INITIALIZE ERROR                    |
| 8    | CASSETTE UNLOADING ERROR            |
| 9    | RESERVED                            |

Table 6-2. Mode Codes in Case of Error

| Code | Description                   |
|------|-------------------------------|
| 0    | EJECT (POWER ON)              |
| 1    | EJECT (POWER OFF)             |
| 2    | UNLOAD STOP                   |
| 3    | STOP (POWER ON)               |
| 4    | POWER OFF (CASSETTE IN)       |
| 5    | F. FWD                        |
| 6    | REW                           |
| 7    | LOW SPEED F. FWD              |
| 8    | LOW SPEED REW                 |
| 9    | STANDBY                       |
| 10   | REC                           |
| 11   | REC (VISS)                    |
| 12   | REC PAUSE                     |
| 13   | PLAY                          |
| 14   | A. DUB                        |
| 15   | A. DUB PAUSE                  |
| 16   | CUE                           |
| 17   | REV                           |
| 18   | STILL (MECHA FWD)             |
| 19   | FWD FRAME BY FRAME (FWD SLOW) |
| 20   | STILL (MECHA RVS)             |
| 21   | RVS FRAME BY FRAME (RVS SLOW) |

## SECTION 7 ADJUSTMENTS

During the adjustment, see the Parts Arrangement Diagram for Adjustments on Page 7-6.

### 7-1. MECHANICAL ADJUSTMENTS

Refer to the SERVICE MANUAL of VHS MECHANICAL ADJUSTMENT VI.

### 7-2. ELECTRICAL ADJUSTMENTS

#### 2-1. PRE-ADJUSTMENT PREPARATIONS

Necessary items and indications for total adjustment of electric circuit of this machine will be described in this chapter.

##### 2-1-1. Instruments to be Used

- 1) Color TV
- 2) Oscilloscope 1 or 2 phenomena, band more than 30 MHz, delay mode, as provided.
- 3) NTSC pattern generator
- 4) Digital voltmeter
- 5) Audio level meter
- 6) Audio noise meter
- 7) Audio generator
- 8) Attenuator
- 9) Alignment tape

Part Code: 8-192-605-32 KRV-51N2

##### 2-1-2. Connection

Unless otherwise specified, connect and adjust the measuring instruments as shown in the following diagram.

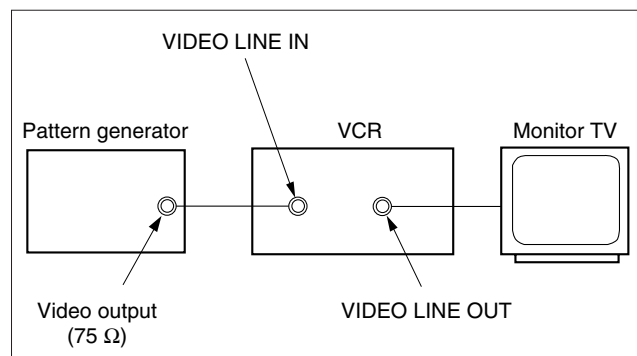


Fig. 7-2-1

##### 2-1-3. Set-up of Adjustment

In this adjustment, NTSC pattern generator is connected with LINE input signal terminal. When checking with tuner, connected AERIAL terminal. Check that the amplitudes of video signal SYNC signal, of picture portions, and of burst signals are flat at approximately 0.3, 0.7 and 0.3 V, respectively, and that the level ratio of the burst signal and "red" signal are 0.30: 0.66. Fig. 7-2-2. shows video signals (color bars) used in adjusting the video section.

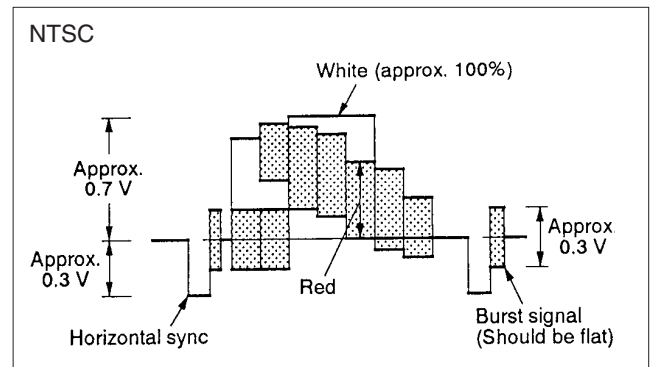


Fig. 7-2-2

##### 2-1-4. Alingment Tapes

[Alignment Tape (KRV-51N2/KRV-51P)]

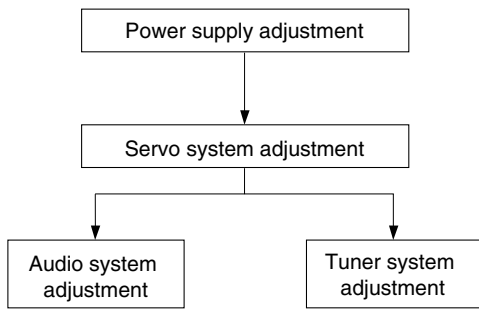
|   | Mode | Time          | Video signal | Audio signal (HiFi/Normal) |
|---|------|---------------|--------------|----------------------------|
| 1 | SP   | Seven minutes | Color bar    | 400 Hz                     |
| 2 | SP   | Three minutes | Monoscope    |                            |
| 3 | EP   | Seven minutes | Color bar    |                            |
| 4 | EP   | Three minutes | Monoscope    |                            |

##### 2-1-5. Specified I/O Level and Impedance Input/output terminal

|               |                                                                                                 |
|---------------|-------------------------------------------------------------------------------------------------|
| Video inputs  | LINE IN : phono jack<br>1 Vp-p, 75 Ω, unbalanced, sync negative                                 |
| Audio inputs  | LINE IN : phono jacks<br>47 kW, -7.5 dBs (0 dBs = 0.775 Vrms)<br>More than 10 kW, -4 dBs        |
| Video outputs | LINE OUT : phono jack<br>1 Vp-p, 75 Ω, unbalanced, sync negative                                |
| Audio outputs | LINE OUT : phono jacks<br>-7.5 dBs at load impedance 47 kW<br>Output impedance : less than 10 Ω |

### 2-1-6. Adjusting Sequence

Make the electrical adjustment in the following sequence.



## 2-2. POWER SUPPLY ADJUSTMENT

### 2-2-1. Power Supply Check

|                      |                                     |
|----------------------|-------------------------------------|
| Mode                 | E-E                                 |
| Measuring Instrument | Digital voltmeter                   |
| +F, -F check         |                                     |
| Measurement Point    | Between JL 615 (IF) and JL 614 (-F) |
| Specified Value      | $3.0 \pm 1.0$ V                     |
| -13 V check          |                                     |
| Measurement Point    | JL 625                              |
| Specified Value      | $-11.0 \pm 1.5$ V                   |
| +6 V check           |                                     |
| Measurement Point    | JL 611                              |
| Specified Value      | $5.95 \pm 0.3$ V                    |
| +13 V check          |                                     |
| Measurement Point    | JL 604                              |
| Specified Value      | $13.5 \pm 1.0$ V                    |
| +38 V check          |                                     |
| Measurement Point    | JL 618                              |
| Specified Value      | $32.0 \pm 4.0$ V                    |

#### Checking Method:

- 1) Confirm that each voltage meets its specified value.

## 2-3. SERVO SYSTEM ADJUSTMENT

### 2-3-1. RF Switching Position Adjustment (MA-402 BOARD)

#### Purpose:

Adjust the interval between A ch and B ch of tape playback output. Improve the interchangeability with other tapes and sets.

When it is out of order, the interval appears on the screen, the screen is disturbed.

|                      |                                                     |
|----------------------|-----------------------------------------------------|
| Mode                 | PB                                                  |
| Signal               | Alignment tape SP mode color bar                    |
| Measurement Point    | CH1: Pin ② of CN202<br>CH2: Pin ③ of CN202 (RF SWP) |
| Measuring Instrument | Oscilloscope                                        |
| Specified Value      | $6.5 \pm 0.5$ H ( $410 \pm 32$ $\mu$ sec) NTSC      |

#### Adjusting Method:

- 1) Connect MA-402 board JS401 to the GND for about 1 second to activate the RF switching position adjustment mode.
- 2) Check appear "A P" on FL display.
- 3) Using the channel + and - buttons, adjust to  $6.5 \pm 0.5$  H.
- 4) Press the pause button.

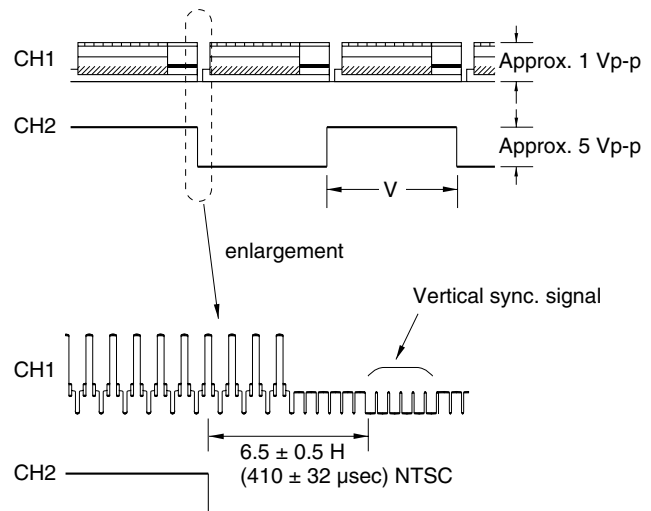


Fig. 7-2-3.

## 2-4. AUDIO SYSTEM ADJUSTMENTS

- Adjust both Lch and Rch.

### [Connection]

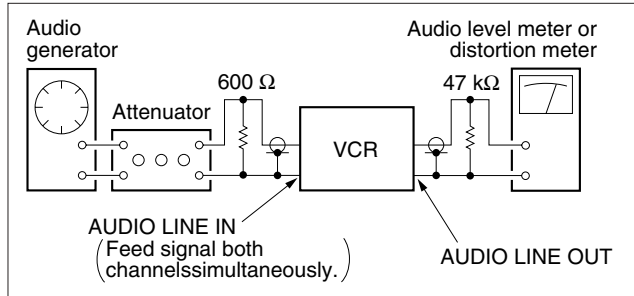


Fig. 7-2-4.

### 2-4-1. Hi-Fi Audio System Adjustment (SLV-EX80S/EX90S)

- Set switches and knobs to the following positions to make adjustment unless otherwise specified.

INPUT SELECT switch ..... LINE  
AUDIO MONITOR ..... STEREO

### [Adjustment Sequence]

- AF Switching Position Adjustment
- Frequency Response Check
- Overall Level Characteristic and Distortion Factor Check
- Overall S/N Check

#### 1. AF Switching Position Adjustment (MA-402 BOARD)

##### Purpose:

Adjust the interval between A CH and B CH of tape playback output. Improve the interchangeability with other tapes and sets. When it is out of order, noisy sound is increased and big noise is heard.

| Mode                 | PB                                         |
|----------------------|--------------------------------------------|
| Signal               | Alignment tape SP mode color bar           |
| Measurement point    | CH1: Pin ③ of CN202<br>CH2: Pin ① of CN202 |
| Measuring Instrument | Oscilloscope                               |
| Specified Value      | Fig. 7-2-5                                 |

##### Adjusting Method:

- Connect MA-402 board JS401 to the GND for about 1 second to activate the RF switching position adjustment mode.
- Press the PLAY button to activate the AF switching position adjustment mode.
- Check appear "A H" on FL display.
- Using the channels + and - buttons, minimize a chipped portion. At this time, confirm that a noisy sound is not heard.
- Press the pause button.

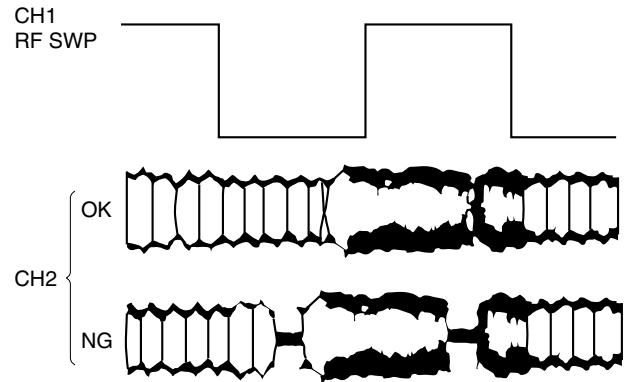


Fig. 7-2-5.

## 2. Frequency Response Check

### Purpose:

Confirm that the frequency characteristic is within the specification.

| Mode                  | REC and PB (SP, EP mode)                                   |
|-----------------------|------------------------------------------------------------|
| Signal                | 400 Hz, -17.5 dBs<br>20 Hz, -17.5 dBs<br>20 kHz, -17.5 dBs |
| Measurement point     | Audio output terminal                                      |
| Measurement equipment | Audio level meter                                          |
| Specified value       | 0 ± 2 dB                                                   |

**Note:** Tape path adjustment must have been completed.

### Confirmation Method:

- Supply a signal of 400 Hz, -17.5 dBs to both L and R channels of Audio Line Input.
- Connect the audio level meter to the Audio Line Output.
- Adjust the attenuator so that the audio level meter will indicate -17.5 dBs.
- Make recording.
- Set an audio line input signal to 20 Hz and make recording.
- Set an audio line input signal to 20 kHz and make recording.
- Playback a recorded portion, and measure output levels at 400 Hz and 20 Hz and 20 kHz.
- Confirm that the 20 Hz and 20 kHz playback output level within a range of the 400 Hz playback output level 0 ± 2 dB.

### 3. Overall Level Characteristic and Distortion Factor Check

#### Purpose:

Check the record level, play level, and distortion factor against the reference input.

|                       |                                                                     |
|-----------------------|---------------------------------------------------------------------|
| Mode                  | REC and PB (SP mode)                                                |
| Signal                | 400 Hz, $-7.5$ dBs                                                  |
| Measurement point     | Audio output terminal                                               |
| Measurement equipment | Audio level meter and distortion factor meter                       |
| Specified value       | Playback level: $-7.5 \pm 2.0$ dBs<br>Distortion factor: 1% or less |

#### Confirmation Method:

- 1) Supply an audio signal of 400 Hz,  $-7.5$  dBs simultaneously to both L and R channels of Audio Line Input.
- 2) Make recording
- 3) Play back a recorded portion.
- 4) Confirm that a playback level is  $-7.5 \pm 2.0$  dBs.
- 5) Confirm that a distortion factor is within 1%.

### 4. Overall S/N Check

#### Purpose:

Confirm that the S/N is within the specification.

|                       |                       |
|-----------------------|-----------------------|
| Mode                  | REC and PB (SP mode)  |
| Signal                | Short                 |
| Measurement point     | Audio output terminal |
| Measurement equipment | Audio noise meter     |
| Specified value       | $-67.5$ dBs or less   |

#### Confirmation Method:

- 1) Connect both L and R channels of audio line input to the GND.
- 2) Start recording.
- 3) Play the recorded part to confirm that the noise is below  $-67.5$  dBs.

### 2-4-2. Normal Audio System Adjustment

- Make adjustment in the SP mode, unless otherwise specified. Use a normal VHS cassette for an adjustment tape.
- Set AUDIO MONITOR to normal.

#### [Adjustment Sequence]

1. ACE Head Adjustment
2. E-E Output Level Check
3. Frequency Response Check
4. Overall Level Characteristic and Distortion Factor Check
5. Overall S/N Check

#### 1. ACE Head Adjustment

Refer to the SERVICE MANUAL of VHS MECHANICAL ADJUSTMENT VI.

#### 2. E-E Output Level Check (SLV-EX50)

#### Purpose:

Confirm that the output level against the reference input is within the specification.

|                       |                          |
|-----------------------|--------------------------|
| Mode                  | E-E                      |
| Signal                | L, R: 400 Hz, $-7.5$ dBs |
| Measurement point     | Audio output terminal    |
| Measurement equipment | Audio level meter        |
| Specified value       | $-7.5 \pm 2.0$ dBs       |

#### Confirmation Method:

- 1) Simultaneously input a signal of 400 Hz,  $-7.5$  dBs to both L and R channels of Audio Line Input.
- 2) Confirm that the audio output level is  $-7.5 \pm 3.0$  dBs.  
(This level only can appear with mono models)

#### 3. Frequency Response Check

#### Purpose:

Confirm that the frequency characteristic is within the specification.

|                       |                                           |
|-----------------------|-------------------------------------------|
| Mode                  | REC and PB (SP mode)                      |
| Signal                | 400 Hz, $-17.5$ dBs<br>7 kHz, $-17.5$ dBs |
| Measurement point     | Audio output terminal                     |
| Measurement equipment | Audio level meter                         |
| Specified value       | $0 \pm 4$ dB                              |

Tape path adjustment must have been completed.

#### Confirmation Method:

- 1) Supply a signal of 400 Hz,  $-17.5$  dBs to both L and R channels of Audio Line Input.
- 2) Connect the audio level meter to the Audio Line Output.
- 3) Adjust the attenuator so that the audio level meter will indicate  $-17.5$  dBs.
- 4) Make recording in the SP mode.
- 5) Set an audio line input signal to 7 kHz and make recording.
- 6) Playback a recorded portion, and measure output levels at 400 Hz and 7 kHz.
- 7) Confirm that the 7 kHz playback output level within a range of the 400 Hz playback output level  $0 \pm 4$  dB.

#### 4. Overall Level Characteristic and Distortion Factor Check

##### Purpose:

Check the record level, play level, and distortion factor against the reference input.

|                       |                                                                     |
|-----------------------|---------------------------------------------------------------------|
| Mode                  | REC and PB (SP mode)                                                |
| Signal                | 400 Hz, -7.5 dBs                                                    |
| Measurement point     | Audio output terminal                                               |
| Measurement equipment | Audio level meter and distortion factor meter                       |
| Specified value       | Playback level: $-7.5 \pm 4.0$ dBs<br>Distortion factor: 4% or less |

##### Confirmation Method:

- 1) Supply an audio signal of 400 Hz, -7.5 dBs simultaneously to both L and R channels of Audio Line Input.
- 2) Make recording
- 3) Play back a recorded portion.
- 4) Confirm that a playback level is  $-7.5 \pm 4.0$  dBs. (mono audio)
- 5) Confirm that a distortion factor is less than 4%.

#### 5. Overall S/N Check

##### Purpose:

Confirm that the S/N is within the specification.

|                       |                       |
|-----------------------|-----------------------|
| Mode                  | REC and PB (SP mode)  |
| Signal                | Short                 |
| Measurement point     | Audio output terminal |
| Measurement equipment | Audio noise meter     |
| Specified value       | -46.0 dBs or less     |

##### Confirmation Method:

- 1) Connect both L and R channels of audio line input to the GND.
- 2) Start recording.
- 3) Play the recorded part to confirm that the noise is below -46.0 dBs.

#### 2-5. TUNER SYSTEM ADJUSTMENT

##### [Connection]

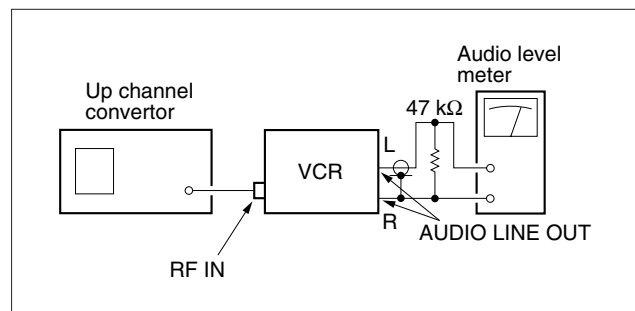


Fig. 7-2-6

##### 2-5-1. Separation Adjustment (SLV-EX80S/EX90S)

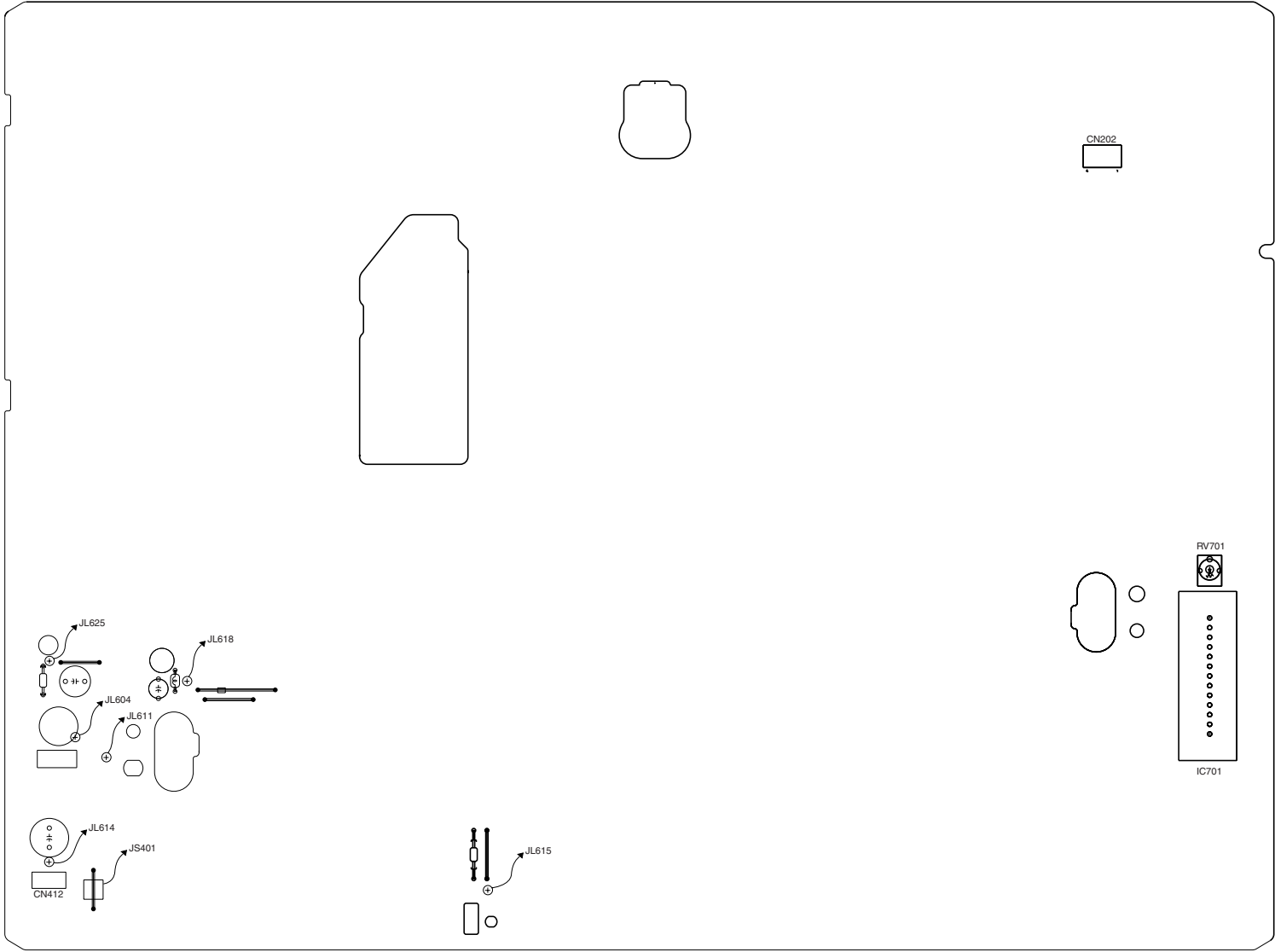
##### Purpose:

Mixed audio signal separate Lch and Rch.

|                       |                                                                                                                                        |
|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Mode                  | E-E                                                                                                                                    |
| Signal                | VIDEO:<br>color bar<br>(White 100% modulation)<br>AUDIO:<br>L NONE<br>R 1 kHz 60% modulation<br>ELECTRIC FIELD:<br>60-80 dBs/75 Ω Term |
| Measurement point     | Pin ⑫ of IC701                                                                                                                         |
| Measurement equipment | Audio level meter                                                                                                                      |
| Adjusting Element     | RV701 (MA-402 Board)                                                                                                                   |
| Specified value       | minimum -9.9 ± 0.2 dBm<br>(700 ± 14mVp-p)                                                                                              |

2-6. PARTS ARRANGEMENT DIAGRAM FOR ADJUSTMENTS

MA-402 BOARD (Side A)



## SECTION 8 REPAIR PARTS LIST

### 8-1. EXPLODED VIEWS

#### NOTE:

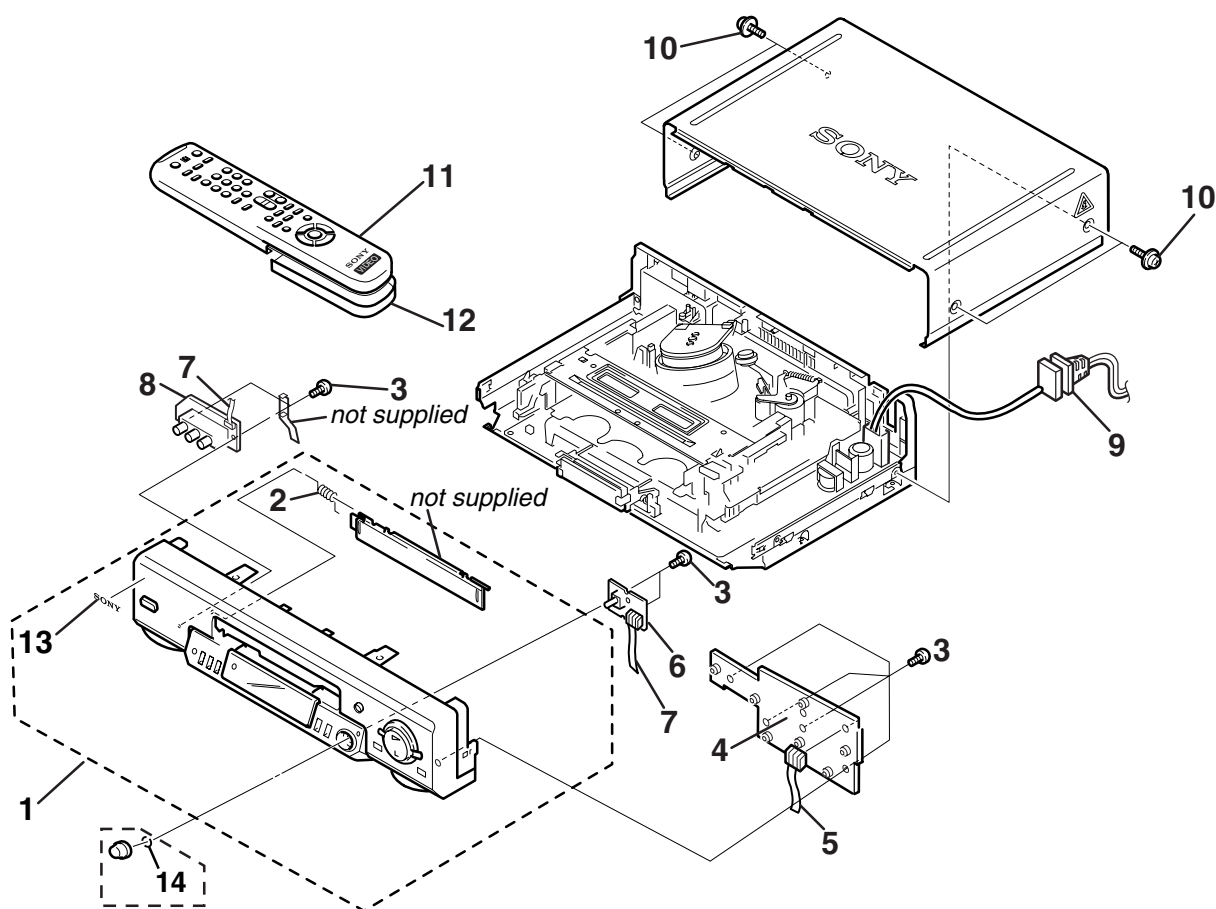
- -XX, -X mean standardized parts, so they may have some differences from the original one.
- Items marked "\*" are not stocked since they are seldom required for routine service.

Some delay should be anticipated when ordering these items.

- The mechanical parts with no reference number in the exploded views are not supplied.

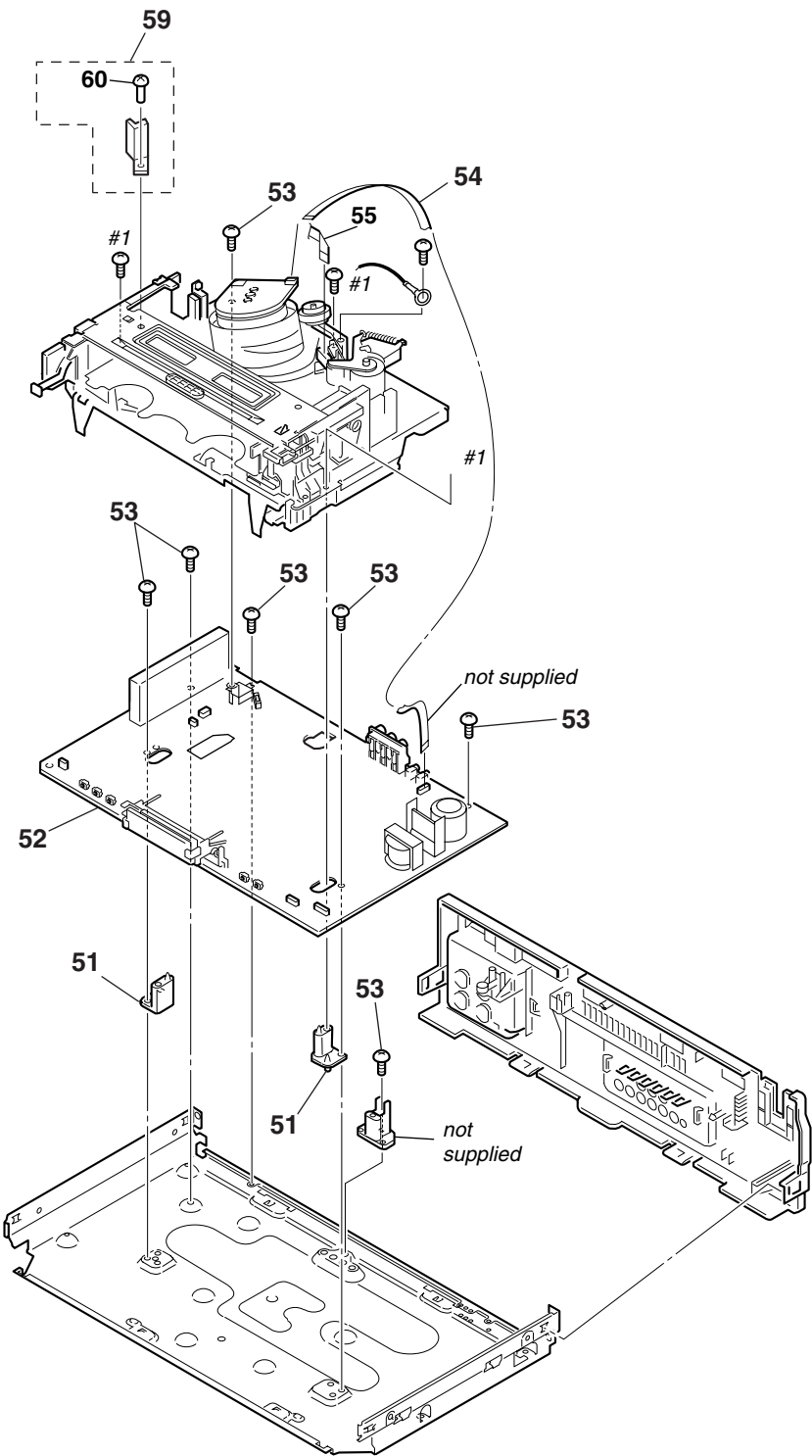
The components identified by mark  or dotted line with mark  are critical for safety. Replace only with part number specified.

#### 8-1-1. FRONT PANEL AND UPPER CASE SECTION



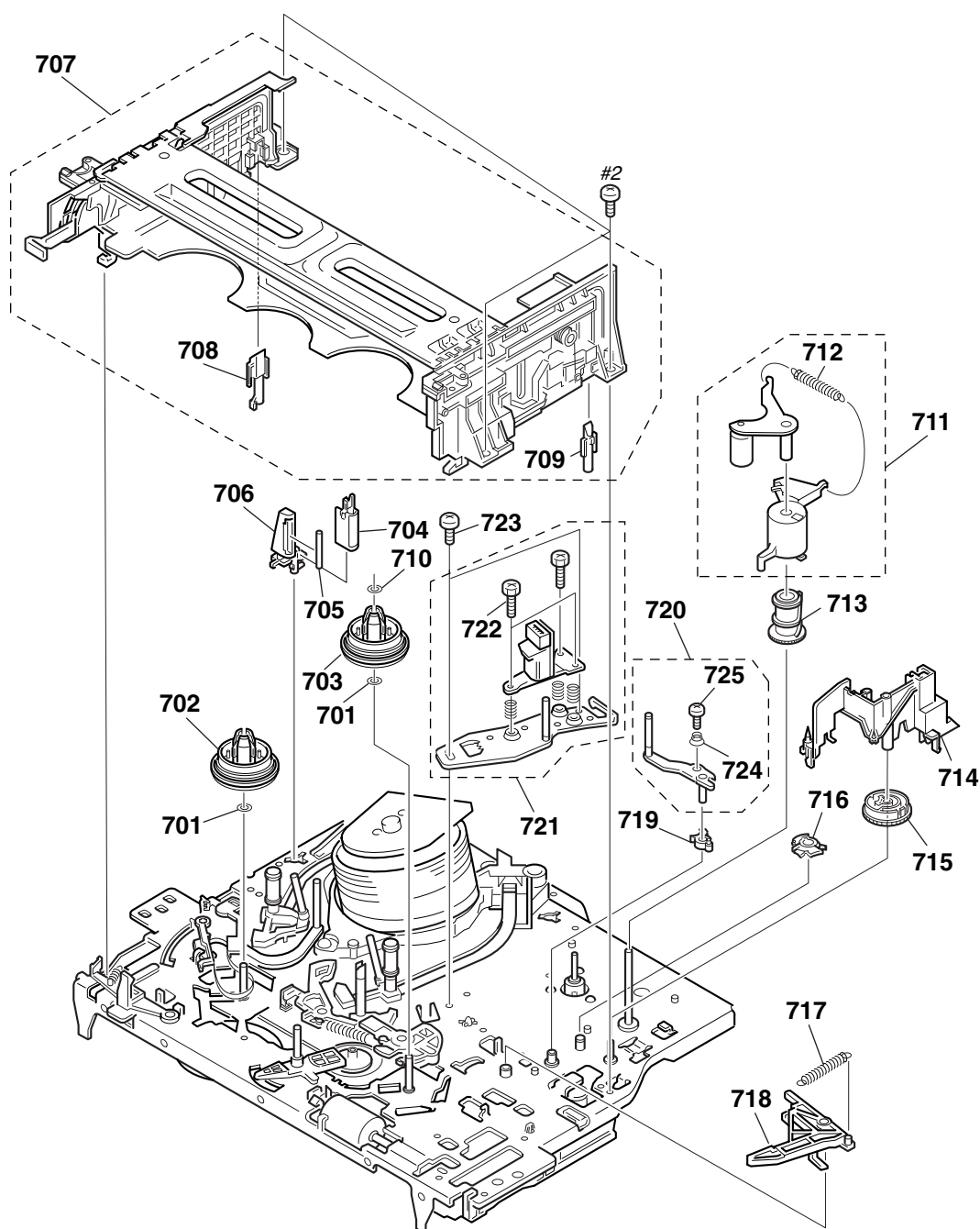
| Ref. No. | Part No.     | Description                     | Remarks   | Ref. No. | Part No.     | Description                          | Remarks      |
|----------|--------------|---------------------------------|-----------|----------|--------------|--------------------------------------|--------------|
| 1        | X-3951-617-1 | PANEL ASSY, FRONT               | (EX90SAR) | * 8      | A-6713-947-A | FJ-031 COMPLETE PWB                  | (EX80S)      |
| 1        | X-3951-618-1 | PANEL ASSY, FRONT               | (EX80SAR) | * 8      | A-6713-949-A | FJ-031 COMPLETE PWB                  | (EX50)       |
| 1        | X-3951-619-1 | PANEL ASSY, FRONT               | (EX50AR)  | 9        | 1-791-157-31 | CORD, POWER (EX50AR/EX80SAR/EX90SAR) |              |
| 1        | X-3951-620-1 | PANEL ASSY, FRONT               | (EX90SBR) | 9        | 1-757-665-11 | CORD, POWER (EX50BR/EX80SBR/EX90SBR) |              |
| 1        | X-3951-621-1 | PANEL ASSY, FRONT               | (EX80SBR) | 10       | 3-710-901-62 | SCREW, TAPPING                       |              |
| 1        | X-3951-622-1 | PANEL ASSY, FRONT               | (EX50BR)  | 11       | 1-476-475-71 | COMMANDER, STANDARD (RMT V-312)      | (EX50/EX80S) |
| 2        | 3-953-432-01 | SPRING (GE), FL                 |           | 11       | 1-476-475-81 | COMMANDER, STANDARD (RMT V-312A)     | (EX90S)      |
| 3        | 4-921-277-41 | SCREW (B2.6 x 8), TAPPING, BIND |           | 12       | 3-709-433-11 | COVER, REMOTE CONTROL BATTERY        |              |
| * 4      | A-6713-942-A | DM-098 COMPLETE PWB             |           | 13       | 3-943-995-51 | EMBLEM (NO.5), SONY                  |              |
| 5        | 1-757-552-12 | FLAT CABLE FDM-010              |           | 14       | 3-055-077-01 | SPRING, ETR (P5)                     |              |
| * 6      | A-6713-943-A | DI-081 COMPLETE PWB             |           |          |              |                                      |              |
| 7        | 1-757-553-11 | FLAT CABLE FDI-002              |           |          |              |                                      |              |
| * 8      | A-6713-941-A | FJ-031 COMPLETE PWB             | (EX90S)   |          |              |                                      |              |

8-1-2. CHASSIS SECTION



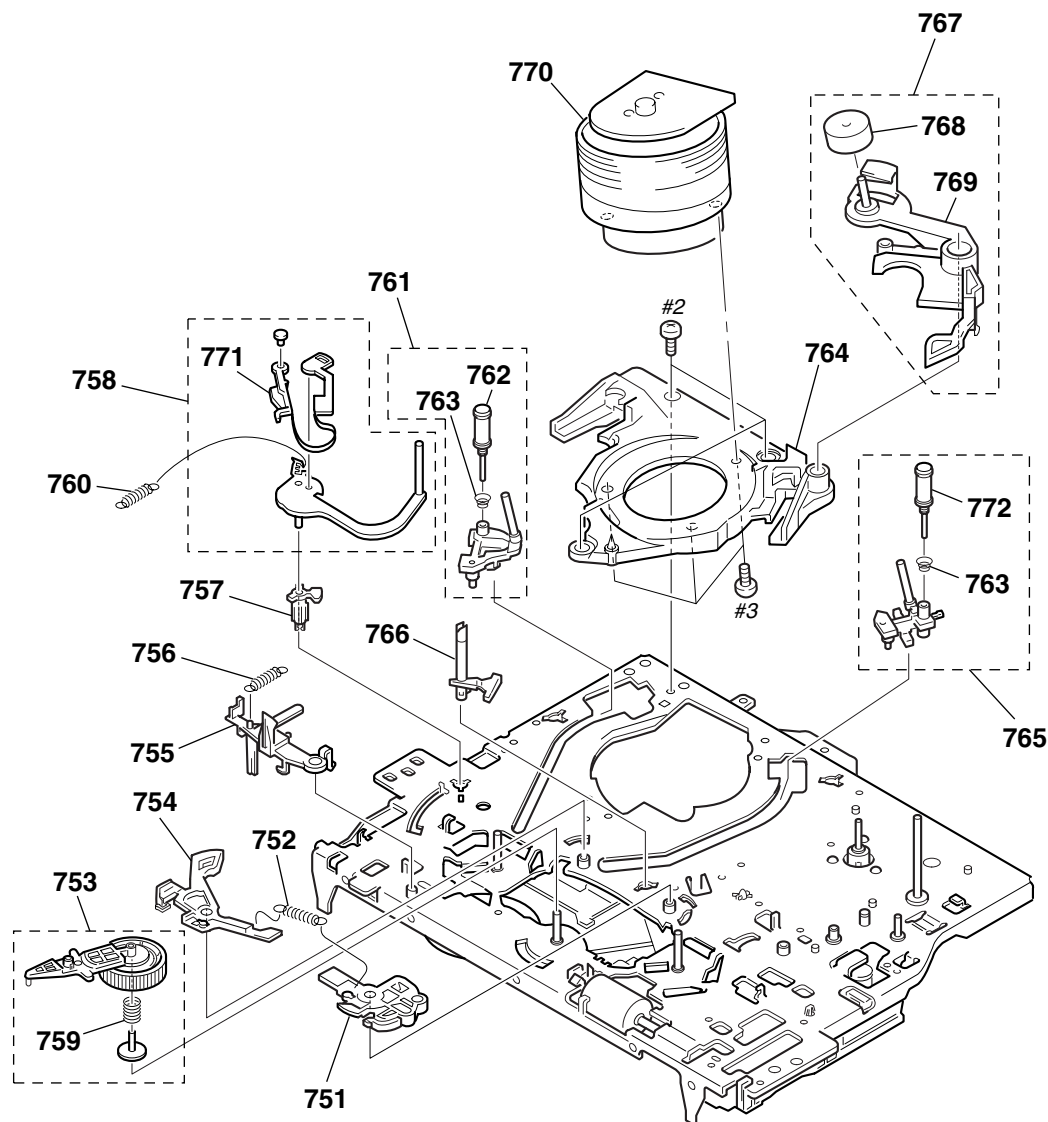
| Ref. No. | Part No.     | Description         | Remarks   | Ref. No. | Part No.     | Description                 | Remarks       |
|----------|--------------|---------------------|-----------|----------|--------------|-----------------------------|---------------|
| 51       | 3-959-383-01 | BASE (R), MD        |           | * 52     | A-6713-948-A | MA-402 COMPLETE PWB         | (EX50BR)      |
| * 52     | A-6713-952-A | MA-402 COMPLETE PWB | (EX90SAR) | 53       | 3-970-608-21 | SUMITITE (B3), +BV          |               |
| * 52     | A-6713-940-A | MA-402 COMPLETE PWB | (EX90SBR) | 54       | 1-757-690-11 | CABLE, FLAT (FMD-022)       |               |
| * 52     | A-6713-953-A | MA-402 COMPLETE PWB | (EX80SAR) | 55       | 1-757-551-11 | CABLE, FLAT (FAC-009)       |               |
| * 52     | A-6713-946-A | MA-402 COMPLETE PWB | (EX80SBR) | 59       | X-3950-969-1 | TC(N17S) ASSY (SL)          | (EX80S/EX90S) |
| * 52     | A-6713-945-A | MA-402 COMPLETE PWB | (EX50AR)  | 60       | 3-342-512-21 | SCREW (B1.7 X 3.5), TAPPING | (EX80S/EX90S) |

## 8-1-3. MECHANISM DECK SECTION-1



| Ref. No. | Part No.     | Description                  | Remarks | Ref. No. | Part No.     | Description                    | Remarks |
|----------|--------------|------------------------------|---------|----------|--------------|--------------------------------|---------|
| 701      | 3-977-509-01 | WASHER, THRUST               |         | 714      | 3-063-773-02 | OPENER, LID (SL)               |         |
| 702      | 3-977-507-01 | TABLE, REEL (S)              |         | 715      | 3-977-441-03 | GEAR, PINCH PRESSING           |         |
| 703      | 3-977-508-01 | TABLE, REEL (T)              |         | 716      | 3-977-445-02 | GEAR, TG8 ARM DRIVING          |         |
| 704      | 1-500-471-11 | HEAD, FE                     |         | * 717    | 3-062-763-01 | SPRING, EXTENSION (RVS BRAKE)  |         |
| 705      | 3-977-495-01 | SHAFT, TG2                   |         | 718      | X-3950-964-1 | ARM ASSY, RVS BRAKE (SL)       |         |
| 706      | 3-977-494-01 | HOLDER, FEH                  |         | 719      | 3-063-756-01 | GEAR, TG8 ARM H/R              |         |
| 707      | A-6776-359-C | FL, COMPLETE ASSY (SL)       |         | 720      | X-3947-590-1 | TG8 ASSY                       |         |
| 708      | 3-977-535-01 | PLATE, LUMINOUS (END SENSOR) |         | 721      | A-6775-791-A | HEAD BLOCK ASSY, ACE (TDK) FFC |         |
| 709      | 3-977-536-01 | PLATE, LUMINOUS (TOP SENSOR) |         | 722      | 3-974-556-11 | + HEXA TT 2.6 x 9 (TAPER)      |         |
| 710      | 3-977-443-01 | WASHER, STOPPER              |         | 723      | 3-979-508-01 | SCREW + HEXA TP SW 3 x 8       |         |
| 711      | A-6759-863-B | PRESS BLOCK ASSY, PINCH      |         | 724      | 3-059-958-01 | SPRING, TG8                    |         |
| 712      | 3-958-455-01 | SPRING (PINCH), TENSION      |         | 725      | 3-051-300-03 | LOCK ACE SCREW                 |         |
| 713      | 3-977-447-01 | GEAR, ELEVATOR               |         | #2       | 7-685-646-79 | SCREW + BVTP 3 x 8 TYPE2       |         |

## 8-1-4. MECHANISM DECK SECTION-2



| Ref. No. | Part No.     | Description                       | Remarks | Ref. No. | Part No.     | Description                                   | Remarks |
|----------|--------------|-----------------------------------|---------|----------|--------------|-----------------------------------------------|---------|
| 751      | X-3949-363-1 | BRAKE ASSY, MAIN (T)              |         | 766      | 3-977-501-01 | PLATE, LUMINOUS                               |         |
| 752      | 3-053-882-01 | SPRING, TENS (MAIN BRAKE)         |         | 767      | A-6746-074-G | ROLLER BLOCK ASSY, HC                         |         |
| 753      | X-3947-573-1 | ARM ASSY, PENDULUM                |         | 768      | X-3947-255-1 | ROLLER ASSY, HC                               |         |
| 754      | X-3951-005-1 | BRAKE ASSY, MAIN (S)              |         | 769      | 3-975-724-07 | ARM, HC                                       |         |
| 755      | 3-063-772-01 | LEVER, REC PROOF (SL)             |         | 770      | 1-796-012-11 | DRUM ASSY DZH-0D1A-R<br>(SLV-EX80SAR/EX90SAR) |         |
| 756      | 3-976-767-01 | SPRING, TENS. (REC PROOF)         |         | 770      | 1-772-366-11 | DRUM ASSY DZH-0B7A-R<br>(SLV-EX80SBR/EX90SBR) |         |
| 757      | 3-977-487-01 | BOSS, TG1 FULCRUM                 |         | 770      | 1-772-363-11 | DRUM ASSY DZH-0B4A-R (SLV-EX50BR)             |         |
| 758      | X-3950-966-1 | TG1 ASSY (SL)                     |         | 770      | 1-796-011-11 | DRUM ASSY DZH-0D0A-R (SLV-EX50AR)             |         |
| 759      | 3-063-958-01 | SPRING,COMP (SL PEND)             |         | 771      | X-3950-968-1 | BAND ASSY, TG1 (SL)                           |         |
| 760      | 3-977-488-01 | SPRING, EXTENSION (POWER TENSION) |         | 772      | X-3949-910-1 | G. ROLLER ASSY                                |         |
| 761      | A-6775-922-A | SHUTTLE (S) BLOCK ASSY            |         | #2       | 7-685-646-79 | SCREW + BVTP 3 x 8 TYPE 2                     |         |
| 762      | X-3949-910-2 | G. ROLLER ASSY                    |         | #3       | 7-682-647-09 | SCREW + P3 x 6                                |         |
| 763      | 3-965-178-01 | SPRING                            |         |          |              |                                               |         |
| 764      | 3-062-687-01 | BASE DRUM, K (UPPER MOTOR)        |         |          |              |                                               |         |
| 765      | A-6750-328-E | SHUTTLE (T) BLOCK ASSY            |         |          |              |                                               |         |





| Ref. No.    | Part No.     | Description                                 | Remarks |
|-------------|--------------|---------------------------------------------|---------|
| <RESISTOR>  |              |                                             |         |
| R533        | 1-216-021-00 | RES-CHIP 68 5% 1/10W<br>(SLV-EX80S/EX90S)   |         |
| R534        | 1-216-097-11 | RES-CHIP 100K 5% 1/10W<br>(SLV-EX80S/EX90S) |         |
| R535        | 1-216-097-11 | RES-CHIP 100K 5% 1/10W<br>(SLV-EX80S/EX90S) |         |
| <SWITCH>    |              |                                             |         |
| S500        | 1-762-196-21 | SWITCH, TACT (I/⏻ PAUSE)                    |         |
|             |              |                                             |         |
| *           | A-6713-945-A | MA-402 BOARD COMPLETE<br>(SLV-EX50AR)       |         |
| *           | A-6713-948-A | MA-402 BOARD COMPLETE<br>(SLV-EX50BR)       |         |
| *           | A-6713-953-A | MA-402 BOARD COMPLETE<br>(SLV-EX80SAR)      |         |
| *           | A-6713-946-A | MA-402 BOARD COMPLETE<br>(SLV-EX80SBR)      |         |
| *           | A-6713-952-A | MA-402 BOARD COMPLETE<br>(SLV-EX90SAR)      |         |
| *           | A-6713-940-A | MA-402 BOARD COMPLETE<br>(SLV-EX90SBR)      |         |
| *****       |              |                                             |         |
|             | 3-064-645-11 | HOLDER, FL                                  |         |
|             | 3-065-718-11 | SINK, HEAT                                  |         |
|             | 3-960-273-11 | SPACER, TOP END                             |         |
| <CAPACITOR> |              |                                             |         |
| C001        | 1-163-009-11 | CERAMIC CHIP 0.001UF 10.00% 50V             |         |
| C002        | 1-163-009-11 | CERAMIC CHIP 0.001UF 10.00% 50V             |         |
| C003        | 1-163-009-11 | CERAMIC CHIP 0.001UF 10.00% 50V             |         |
| C004        | 1-163-009-11 | CERAMIC CHIP 0.001UF 10.00% 50V             |         |
| C005        | 1-128-057-11 | ELECT 330UF 20.00% 6.3V                     |         |
| C031        | 1-128-499-11 | ELECT 220UF 20.00% 16V                      |         |
| C032        | 1-164-232-11 | CERAMIC CHIP 0.01UF 10.00% 50V              |         |
| C034        | 1-164-232-11 | CERAMIC CHIP 0.01UF 10.00% 50V              |         |
| C051        | 1-124-589-11 | ELECT 47UF 20.00% 16V                       |         |
| C053        | 1-164-344-11 | CERAMIC CHIP 0.068UF 10.00% 25V             |         |
| C054        | 1-163-038-00 | CERAMIC CHIP 0.1UF 25V                      |         |
| C071        | 1-163-809-11 | CERAMIC CHIP 0.047UF 10.00% 25V             |         |
| C072        | 1-164-489-11 | CERAMIC CHIP 0.22UF 10.00% 16V              |         |
| C073        | 1-164-232-11 | CERAMIC CHIP 0.01UF 10.00% 50V              |         |
| C074        | 1-163-009-11 | CERAMIC CHIP 0.001UF 10.00% 50V             |         |
| C075        | 1-163-259-91 | CERAMIC CHIP 220PF 5.00% 50V                |         |
| C076        | 1-126-941-11 | ELECT 470UF 20.00% 25V                      |         |
| C100        | 1-163-235-11 | CERAMIC CHIP 22PF 5.00% 50V                 |         |
| C101        | 1-163-038-00 | CERAMIC CHIP 0.1UF 25V                      |         |
| C103        | 1-104-905-11 | CAPACITOR 0.22F 5.5V                        |         |
| C104        | 1-126-935-11 | ELECT 470UF 20.00% 10V                      |         |
| C105        | 1-164-004-11 | CERAMIC CHIP 0.1UF 10.00% 25V               |         |
| C106        | 1-164-232-11 | CERAMIC CHIP 0.01UF 10.00% 50V              |         |
| C107        | 1-164-182-11 | CERAMIC CHIP 0.0033UF 10.00% 50V            |         |
| C108        | 1-163-231-11 | CERAMIC CHIP 15PF 5.00% 50V                 |         |

| Ref. No. | Part No.     | Description                                                  | Remarks |
|----------|--------------|--------------------------------------------------------------|---------|
| C109     | 1-163-231-11 | CERAMIC CHIP 15PF 5.00% 50V                                  |         |
| C110     | 1-163-234-11 | CERAMIC CHIP 20PF 5.00% 50V                                  |         |
| C111     | 1-163-234-11 | CERAMIC CHIP 20PF 5.00% 50V                                  |         |
| C112     | 1-164-489-11 | CERAMIC CHIP 0.22UF 10.00% 16V                               |         |
| C113     | 1-164-004-11 | CERAMIC CHIP 0.1UF 10.00% 25V                                |         |
| C114     | 1-126-947-11 | ELECT 47UF 20.00% 25V                                        |         |
| C141     | 1-164-232-11 | CERAMIC CHIP 0.01UF 10.00% 50V                               |         |
| C142     | 1-164-232-11 | CERAMIC CHIP 0.01UF 10.00% 50V                               |         |
| C143     | 1-164-004-11 | CERAMIC CHIP 0.1UF 10.00% 25V                                |         |
| C151     | 1-164-505-11 | CERAMIC CHIP 2.2UF 16V                                       |         |
| C152     | 1-126-163-11 | ELECT 4.7UF 20.00% 50V                                       |         |
| C154     | 1-126-163-11 | ELECT 4.7UF 20.00% 50V                                       |         |
| C155     | 1-164-232-11 | CERAMIC CHIP 0.01UF 10.00% 50V                               |         |
| C160     | 1-164-232-11 | CERAMIC CHIP 0.01UF 10.00% 50V                               |         |
| C161     | 1-163-096-00 | CERAMIC CHIP 13PF 5.00% 50V                                  |         |
| C162     | 1-163-096-00 | CERAMIC CHIP 13PF 5.00% 50V                                  |         |
| C163     | 1-163-229-11 | CERAMIC CHIP 12PF 5.00% 50V                                  |         |
| C164     | 1-164-232-11 | CERAMIC CHIP 0.01UF 10.00% 50V                               |         |
| C165     | 1-163-235-11 | CERAMIC CHIP 22PF 5.00% 50V<br>(SLV-EX50AR/EX80SAR/EX90SAR)  |         |
| C165     | 1-163-227-11 | CERAMIC CHIP 10PF 0.50PF 50V<br>(SLV-EX50BR/EX80SBR/EX90SBR) |         |
| C167     | 1-164-489-11 | CERAMIC CHIP 0.22UF 10.00% 16V                               |         |
| C168     | 1-164-004-11 | CERAMIC CHIP 0.1UF 10.00% 25V                                |         |
| C169     | 1-163-038-00 | CERAMIC CHIP 0.1UF 25V                                       |         |
| C171     | 1-163-038-00 | CERAMIC CHIP 0.1UF 25V                                       |         |
| C172     | 1-163-245-11 | CERAMIC CHIP 56PF 5.00% 50V                                  |         |
| C192     | 1-163-145-00 | CERAMIC CHIP 0.0015UF 5.00% 50V                              |         |
| C193     | 1-164-004-11 | CERAMIC CHIP 0.1UF 10.00% 25V                                |         |
| C194     | 1-124-589-11 | ELECT 47UF 20.00% 16V                                        |         |
| C195     | 1-124-234-00 | ELECT 22UF 20.00% 16V                                        |         |
| C196     | 1-163-145-00 | CERAMIC CHIP 0.0015UF 5.00% 50V                              |         |
| C201     | 1-164-505-11 | CERAMIC CHIP 2.2UF 16V                                       |         |
| C202     | 1-163-017-00 | CERAMIC CHIP 0.0047UF 10.00% 50V                             |         |
| C203     | 1-164-161-11 | CERAMIC CHIP 0.0022UF 10.00% 50V                             |         |
| C204     | 1-164-161-11 | CERAMIC CHIP 0.0022UF 10.00% 50V                             |         |
| C205     | 1-163-017-00 | CERAMIC CHIP 0.0047UF 10.00% 50V                             |         |
| C206     | 1-163-989-11 | CERAMIC CHIP 0.033UF 10.00% 25V                              |         |
| C207     | 1-164-232-11 | CERAMIC CHIP 0.01UF 10.00% 50V                               |         |
| C208     | 1-163-038-00 | CERAMIC CHIP 0.1UF 25V                                       |         |
| C209     | 1-126-162-11 | ELECT 3.3UF 20.00% 50V                                       |         |
| C210     | 1-163-235-11 | CERAMIC CHIP 22PF 5.00% 50V<br>(SLV-EX50BR/EX80SBR/EX90SBR)  |         |
| C211     | 1-163-235-11 | CERAMIC CHIP 22PF 5.00% 50V<br>(SLV-EX50BR/EX80SBR/EX90SBR)  |         |
| C212     | 1-163-235-11 | CERAMIC CHIP 22PF 5.00% 50V<br>(SLV-EX50BR/EX80SBR/EX90SBR)  |         |
| C213     | 1-163-235-11 | CERAMIC CHIP 22PF 5.00% 50V<br>(SLV-EX50BR/EX80SBR/EX90SBR)  |         |
| C214     | 1-163-239-11 | CERAMIC CHIP 33PF 5.00% 50V<br>(SLV-EX50AR/EX80SAR/EX90SAR)  |         |
| C214     | 1-163-237-11 | CERAMIC CHIP 27PF 5.00% 50V<br>(SLV-EX50BR/EX80SBR/EX90SBR)  |         |
| C215     | 1-164-232-11 | CERAMIC CHIP 0.01UF 10.00% 50V                               |         |
| C216     | 1-109-982-11 | CERAMIC CHIP 1UF 10.00% 10V                                  |         |
| C217     | 1-163-017-00 | CERAMIC CHIP 0.0047UF 10.00% 50V                             |         |
| C218     | 1-124-257-00 | ELECT 2.2UF 20.00% 50V<br>(SLV-EX50AR/EX80SAR/EX90SAR)       |         |
| C218     | 1-126-163-11 | ELECT 4.7UF 20.00% 50V<br>(SLV-EX50BR/EX80SBR/EX90SBR)       |         |

| Ref. No. | Part No.     | Description                                                  | Remarks |
|----------|--------------|--------------------------------------------------------------|---------|
| C219     | 1-163-275-11 | CERAMIC CHIP 0.001UF 5.00% 50V                               |         |
| C220     | 1-107-823-11 | CERAMIC CHIP 0.47UF 10.00% 16V                               |         |
| C221     | 1-163-037-11 | CERAMIC CHIP 0.022UF 10.00% 50V                              |         |
| C222     | 1-163-038-00 | CERAMIC CHIP 0.1UF 25V                                       |         |
| C223     | 1-126-163-11 | ELECT 4.7UF 20.00% 50V                                       |         |
| C224     | 1-109-982-11 | CERAMIC CHIP 1UF 10.00% 10V<br>(SLV-EX80S/EX90S)             |         |
| C225     | 1-164-505-11 | CERAMIC CHIP 2.2UF 16V                                       |         |
| C226     | 1-163-089-00 | CERAMIC CHIP 6PF 0.50PF 50V                                  |         |
| C227     | 1-163-255-11 | CERAMIC CHIP 150PF 5.00% 50V                                 |         |
| C228     | 1-163-038-00 | CERAMIC CHIP 0.1UF 25V                                       |         |
| C229     | 1-126-163-11 | ELECT 4.7UF 20.00% 50V                                       |         |
| C230     | 1-163-235-11 | CERAMIC CHIP 22PF 5.00% 50V<br>(SLV-EX50AR/EX80SAR)          |         |
| C230     | 1-163-241-11 | CERAMIC CHIP 39PF 5.00% 50V<br>(SLV-EX50BR/EX80SBR/EX90SBR)  |         |
| C230     | 1-163-227-11 | CERAMIC CHIP 10PF 0.50PF 50V<br>(SLV-EX90SAR)                |         |
| C231     | 1-163-037-11 | CERAMIC CHIP 0.022UF 10.00% 50V                              |         |
| C232     | 1-163-237-11 | CERAMIC CHIP 27PF 5.00% 50V<br>(SLV-EX50AR/EX80SAR)          |         |
| C232     | 1-163-231-11 | CERAMIC CHIP 15PF 5.00% 50V<br>(SLV-EX90SAR)                 |         |
| C233     | 1-163-038-00 | CERAMIC CHIP 0.1UF 25V                                       |         |
| C234     | 1-124-589-11 | ELECT 47UF 20.00% 16V                                        |         |
| C235     | 1-163-038-00 | CERAMIC CHIP 0.1UF 25V                                       |         |
| C236     | 1-163-038-00 | CERAMIC CHIP 0.1UF 25V                                       |         |
| C237     | 1-164-232-11 | CERAMIC CHIP 0.01UF 10.00% 50V                               |         |
| C238     | 1-126-157-11 | ELECT 10UF 20.00% 16V                                        |         |
| C239     | 1-164-232-11 | CERAMIC CHIP 0.01UF 10.00% 50V                               |         |
| C240     | 1-163-038-00 | CERAMIC CHIP 0.1UF 25V                                       |         |
| C241     | 1-163-038-00 | CERAMIC CHIP 0.1UF 25V                                       |         |
| C242     | 1-163-038-00 | CERAMIC CHIP 0.1UF 25V                                       |         |
| C243     | 1-126-162-11 | ELECT 3.3UF 20.00% 50V                                       |         |
| C244     | 1-164-232-11 | CERAMIC CHIP 0.01UF 10.00% 50V                               |         |
| C245     | 1-126-157-11 | ELECT 10UF 20.00% 16V                                        |         |
| C246     | 1-164-232-11 | CERAMIC CHIP 0.01UF 10.00% 50V                               |         |
| C247     | 1-164-489-11 | CERAMIC CHIP 0.22UF 10.00% 16V                               |         |
| C248     | 1-124-257-00 | ELECT 2.2UF 20.00% 50V                                       |         |
| C249     | 1-164-232-11 | CERAMIC CHIP 0.01UF 10.00% 50V                               |         |
| C250     | 1-124-589-11 | ELECT 47UF 20.00% 16V                                        |         |
| C251     | 1-164-505-11 | CERAMIC CHIP 2.2UF 16V                                       |         |
| C252     | 1-163-263-11 | CERAMIC CHIP 330PF 5.00% 50V<br>(SLV-EX50/EX80SAR/EX90SAR)   |         |
| C252     | 1-163-127-00 | CERAMIC CHIP 270PF 5.00% 50V<br>(SLV-EX80SBR/EX90SBR)        |         |
| C253     | 1-109-982-11 | CERAMIC CHIP 1UF 10.00% 10V                                  |         |
| C254     | 1-163-017-00 | CERAMIC CHIP 0.0047UF 10.00% 50V                             |         |
| C255     | 1-164-161-11 | CERAMIC CHIP 0.0022UF 10.00% 50V                             |         |
| C256     | 1-164-161-11 | CERAMIC CHIP 0.0022UF 10.00% 50V                             |         |
| C257     | 1-163-017-00 | CERAMIC CHIP 0.0047UF 10.00% 50V                             |         |
| C258     | 1-109-982-11 | CERAMIC CHIP 1UF 10.00% 10V                                  |         |
| C259     | 1-163-255-11 | CERAMIC CHIP 150PF 5.00% 50V<br>(SLV-EX50BR/EX80SBR/EX90SBR) |         |
| C262     | 1-163-239-11 | CERAMIC CHIP 33PF 5.00% 50V<br>(SLV-EX50BR/EX80SBR/EX90SBR)  |         |
| C262     | 1-163-243-11 | CERAMIC CHIP 47PF 5.00% 50V<br>(SLV-EX50AR/EX80SAR/EX90SAR)  |         |
| C264     | 1-163-255-11 | CERAMIC CHIP 150PF 5.00% 50V<br>(SLV-EX50BR/EX80SBR/EX90SBR) |         |

| Ref. No. | Part No.     | Description                                           | Remarks |
|----------|--------------|-------------------------------------------------------|---------|
| C289     | 1-164-004-11 | CERAMIC CHIP 0.1UF 10.00% 25V<br>(SLV-EX90S)          |         |
| C290     | 1-126-163-11 | ELECT 4.7UF 20.00% 50V<br>(SLV-EX90S)                 |         |
| C291     | 1-164-489-11 | CERAMIC CHIP 0.22UF 10.00% 16V<br>(SLV-EX90S)         |         |
| C292     | 1-164-505-11 | CERAMIC CHIP 2.2UF 16V<br>(SLV-EX90S)                 |         |
| C294     | 1-164-232-11 | CERAMIC CHIP 0.01UF 10.00% 50V<br>(SLV-EX90S)         |         |
| C295     | 1-164-232-11 | CERAMIC CHIP 0.01UF 10.00% 50V<br>(SLV-EX90S)         |         |
| C296     | 1-126-157-11 | ELECT 10UF 20.00% 16V<br>(SLV-EX90S)                  |         |
| C298     | 1-126-163-11 | ELECT 4.7UF 20.00% 50V<br>(SLV-EX90S)                 |         |
| C299     | 1-164-232-11 | CERAMIC CHIP 0.01UF 10.00% 50V<br>(SLV-EX90S)         |         |
| C303     | 1-164-505-11 | CERAMIC CHIP 2.2UF 16V<br>(SLV-EX80S/EX90S)           |         |
| C304     | 1-164-232-11 | CERAMIC CHIP 0.01UF 10.00% 50V<br>(SLV-EX80S/EX90S)   |         |
| C307     | 1-124-589-11 | ELECT 47UF 20.00% 16V<br>(SLV-EX80S/EX90S)            |         |
| C308     | 1-126-964-11 | ELECT 10UF 20.00% 50V<br>(SLV-EX80S/EX90S)            |         |
| C309     | 1-163-020-00 | CERAMIC CHIP 0.0082UF 10.00% 50V<br>(SLV-EX80S/EX90S) |         |
| C310     | 1-126-947-11 | ELECT 47UF 20.00% 25V<br>(SLV-EX80S/EX90S)            |         |
| C311     | 1-126-964-11 | ELECT 10UF 20.00% 50V<br>(SLV-EX80S/EX90S)            |         |
| C312     | 1-124-257-00 | ELECT 2.2UF 20.00% 50V<br>(SLV-EX80S/EX90S)           |         |
| C313     | 1-126-964-11 | ELECT 10UF 20.00% 50V<br>(SLV-EX80S/EX90S)            |         |
| C314     | 1-126-947-11 | ELECT 47UF 20.00% 25V<br>(SLV-EX80S/EX90S)            |         |
| C315     | 1-163-020-00 | CERAMIC CHIP 0.0082UF 10.00% 50V<br>(SLV-EX80S/EX90S) |         |
| C316     | 1-126-964-11 | ELECT 10UF 20.00% 50V<br>(SLV-EX80S/EX90S)            |         |
| C317     | 1-126-160-11 | ELECT 1UF 20.00% 50V<br>(SLV-EX80S/EX90S)             |         |
| C318     | 1-126-964-11 | ELECT 10UF 20.00% 50V<br>(SLV-EX80S/EX90S)            |         |
| C319     | 1-126-964-11 | ELECT 10UF 20.00% 50V<br>(SLV-EX80S/EX90S)            |         |
| C320     | 1-126-964-11 | ELECT 10UF 20.00% 50V<br>(SLV-EX80S/EX90S)            |         |
| C322     | 1-126-964-11 | ELECT 10UF 20.00% 50V<br>(SLV-EX80S/EX90S)            |         |
| C323     | 1-163-038-00 | CERAMIC CHIP 0.1UF 25V<br>(SLV-EX80S/EX90S)           |         |
| C324     | 1-164-232-11 | CERAMIC CHIP 0.01UF 10.00% 50V<br>(SLV-EX80S/EX90S)   |         |
| C326     | 1-164-489-11 | CERAMIC CHIP 0.22UF 10.00% 16V<br>(SLV-EX80S/EX90S)   |         |
| C327     | 1-164-489-11 | CERAMIC CHIP 0.22UF 10.00% 16V<br>(SLV-EX80S/EX90S)   |         |
| C328     | 1-164-489-11 | CERAMIC CHIP 0.22UF 10.00% 16V<br>(SLV-EX80S/EX90S)   |         |
| C350     | 1-126-157-11 | ELECT 10UF 20.00% 16V                                 |         |

| Ref. No. | Part No.     | Description  | Remarks                                             | Ref. No.           | Part No.                                    | Description  | Remarks                                |
|----------|--------------|--------------|-----------------------------------------------------|--------------------|---------------------------------------------|--------------|----------------------------------------|
| C351     | 1-163-038-00 | CERAMIC CHIP | 0.1UF 25V                                           | C636               | 1-126-967-11                                | ELECT        | 47UF 20.00% 50V                        |
| C352     | 1-163-037-11 | CERAMIC CHIP | 0.022UF 10.00% 50V                                  | C661               | 1-164-232-11                                | CERAMIC CHIP | 0.01UF 10.00% 50V                      |
| C354     | 1-124-234-00 | ELECT        | 22UF 20.00% 16V                                     | C662               | 1-104-666-11                                | ELECT        | 220UF 20.00% 25V                       |
| C355     | 1-126-157-11 | ELECT        | 10UF 20.00% 16V                                     | C663               | 1-126-941-11                                | ELECT        | 470UF 20.00% 25V                       |
| C356     | 1-163-011-11 | CERAMIC CHIP | 0.0015UF 10.00% 50V                                 | C664               | 1-124-589-11                                | ELECT        | 47UF 20.00% 16V                        |
| C357     | 1-163-011-11 | CERAMIC CHIP | 0.0015UF 10.00% 50V<br>(SLV-EX50AR/EX80SAR/EX90SAR) | C665               | 1-124-234-00                                | ELECT        | 22UF 20.00% 16V                        |
| C357     | 1-163-014-00 | CERAMIC CHIP | 0.0027UF 10.00% 50V<br>(SLV-EX50BR/EX80SBR/EX90SBR) | C669               | 1-164-232-11                                | CERAMIC CHIP | 0.01UF 10.00% 50V                      |
| C358     | 1-126-163-11 | ELECT        | 4.7UF 20.00% 50V                                    | C671               | 1-126-965-91                                | ELECT        | 22UF 20.00% 50V                        |
| C359     | 1-126-157-11 | ELECT        | 10UF 20.00% 16V                                     | C673               | 1-164-232-11                                | CERAMIC CHIP | 0.01UF 10.00% 50V                      |
| C361     | 1-126-160-11 | ELECT        | 1UF 20.00% 50V                                      | C674               | 1-126-933-11                                | ELECT        | 100UF 20.00% 16V                       |
| C362     | 1-126-160-11 | ELECT        | 1UF 20.00% 50V<br>(SLV-EX50)                        | C704               | 1-163-009-11                                | CERAMIC CHIP | 0.001UF 10.00% 50V                     |
| C363     | 1-124-234-00 | ELECT        | 22UF 20.00% 16V                                     | C705               | 1-164-232-11                                | CERAMIC CHIP | 0.01UF 10.00% 50V                      |
| C364     | 1-126-163-11 | ELECT        | 4.7UF 20.00% 50V                                    | C706               | 1-126-933-11                                | ELECT        | 100UF 20.00% 16V                       |
| C365     | 1-164-232-11 | CERAMIC CHIP | 0.01UF 10.00% 50V                                   | C707               | 1-126-947-11                                | ELECT        | 47UF 20.00% 25V                        |
| C371     | 1-163-009-11 | CERAMIC CHIP | 0.001UF 10.00% 50V                                  | C708               | 1-126-163-11                                | ELECT        | 4.7UF 20.00% 50V                       |
| C373     | 1-137-505-11 | MYLAR        | 220PF 5.00% 50V                                     | C709               | 1-163-009-11                                | CERAMIC CHIP | 0.001UF 10.00% 50V                     |
| C375     | 1-104-696-11 | FILM         | 0.015UF 5.00% 100V                                  | C710               | 1-163-009-11                                | CERAMIC CHIP | 0.001UF 10.00% 50V                     |
| C376     | 1-163-011-11 | CERAMIC CHIP | 0.0015UF 10.00% 50V                                 | C711               | 1-163-009-11                                | CERAMIC CHIP | 0.001UF 10.00% 50V                     |
| C377     | 1-162-306-11 | CERAMIC      | 0.01UF 20.00% 16V                                   | C712               | 1-126-933-11                                | ELECT        | 100UF 20.00% 16V                       |
| C378     | 1-124-589-11 | ELECT        | 47UF 20.00% 16V                                     | C713               | 1-164-232-11                                | CERAMIC CHIP | 0.01UF 10.00% 50V                      |
| C379     | 1-163-038-00 | CERAMIC CHIP | 0.1UF 25V                                           | C714               | 1-164-489-11                                | CERAMIC CHIP | 0.22UF 10.00% 16V                      |
| C385     | 1-126-160-11 | ELECT        | 1UF 20.00% 50V<br>(SLV-EX80S/EX90S)                 | C715               | 1-163-989-11                                | CERAMIC CHIP | 0.033UF 10.00% 25V<br>(SLV-EX50)       |
| C386     | 1-126-160-11 | ELECT        | 1UF 20.00% 50V<br>(SLV-EX80S/EX90S)                 | C719               | 1-163-038-00                                | CERAMIC CHIP | 0.1UF 25V<br>(SLV-EX80S/EX90S)         |
| C451     | 1-124-584-00 | ELECT        | 100UF 20.00% 10V                                    | C720               | 1-126-157-11                                | ELECT        | 10UF 20.00% 16V<br>(SLV-EX80S/EX90S)   |
| C452     | 1-164-232-11 | CERAMIC CHIP | 0.01UF 10.00% 50V                                   | C722               | 1-126-933-11                                | ELECT        | 100UF 20.00% 16V<br>(SLV-EX80S/EX90S)  |
| C453     | 1-126-157-11 | ELECT        | 10UF 20.00% 16V                                     | C723               | 1-164-232-11                                | CERAMIC CHIP | 0.01UF 10.00% 50V<br>(SLV-EX80S/EX90S) |
| C454     | 1-163-038-00 | CERAMIC CHIP | 0.1UF 25V                                           | C901               | 1-126-160-11                                | ELECT        | 1UF 20.00% 50V<br>(SLV-EX80S/EX90S)    |
| C455     | 1-124-584-00 | ELECT        | 100UF 20.00% 10V                                    | C902               | 1-126-160-11                                | ELECT        | 1UF 20.00% 50V<br>(SLV-EX80S/EX90S)    |
| C456     | 1-164-232-11 | CERAMIC CHIP | 0.01UF 10.00% 50V                                   | C903               | 1-126-935-11                                | ELECT        | 470UF 20.00% 10V                       |
| C457     | 1-126-941-11 | ELECT        | 470UF 20.00% 25V                                    | C907               | 1-124-589-11                                | ELECT        | 47UF 20.00% 16V                        |
| △C600    | 1-104-705-11 | MYLAR        | 0.1UF 20.00% 250V                                   | <CONNECTOR>        |                                             |              |                                        |
| △C601    | 1-104-705-11 | MYLAR        | 0.1UF 20.00% 250V                                   | CN031*1-766-716-11 | CONNECTOR, BOARD TO BOARD 3P                |              |                                        |
| △C602    | 1-113-900-11 | CERAMIC      | 470PF 10.00% 250V                                   | CN051              | CONNECTOR, BOARD TO BOARD 8P                |              |                                        |
| △C603    | 1-113-900-11 | CERAMIC      | 470PF 10.00% 250V                                   | CN072              | CONNECTOR, FFC/FPC 5P                       |              |                                        |
| △C604    | 1-113-900-11 | CERAMIC      | 470PF 10.00% 250V                                   | CN072              | CONNECTOR, FFC/FPC 5P                       |              |                                        |
| △C605    | 1-107-405-11 | ELECT(BLOCK) | 68UF 20.00% 400V<br>(SLV-EX50AR/EX80SAR/EX90SAR)    | CN105              | PIN, CONNECTOR 5P                           |              |                                        |
| △C605    | 1-125-917-11 | ELECT(BLOCK) | 100UF 20.00% 450V<br>(SLV-EX50BR/EX80SBR/EX90SBR)   | CN201              | CONNECTOR, FFC/FPC 11P<br>(SLV-EX80S/EX90S) |              |                                        |
| C606     | 1-130-470-00 | MYLAR        | 820PF 5.00% 50V                                     | CN202*1-560-892-00 | PIN, CONNECTOR 4P                           |              |                                        |
| C607     | 1-107-737-11 | MYLAR        | 560PF 5.00% 50V                                     | CN204              | HOUSING, CONNECTOR 6P (SLV-EX50)            |              |                                        |
| △C608    | 1-131-974-11 | FILM         | 2200PF 5% 800V                                      | CN331              | CONNECTOR, FFC/FPC 7P                       |              |                                        |
| C610     | 1-137-921-11 | ELECT        | 1500UF 20% 10V                                      | CN331              | CONNECTOR, FFC/FPC 7P                       |              |                                        |
| C611     | 1-126-935-11 | ELECT        | 470UF 20.00% 16V                                    | CN332              | PIN, CONNECTOR 3P                           |              |                                        |
| C612     | 1-126-960-11 | ELECT        | 1UF 20.00% 50V                                      | CN332              | PIN, CONNECTOR 3P                           |              |                                        |
| C613     | 1-130-496-00 | MYLAR        | 0.12UF 5.00% 50V                                    | CN334              | CONNECTOR, FFC/FPC 7P                       |              |                                        |
| C615     | 1-131-976-21 | ELECT        | 820UF 20% 25V                                       | CN334              | CONNECTOR, FFC/FPC 7P                       |              |                                        |
| C616     | 1-126-941-11 | ELECT        | 470UF 20.00% 25V                                    | CN411              | CONNECTOR, FFC/FPC 7P                       |              |                                        |
| C624     | 1-126-967-11 | ELECT        | 47UF 20.00% 50V                                     | CN411              | CONNECTOR, FFC/FPC 7P                       |              |                                        |
| C626     | 1-126-967-11 | ELECT        | 47UF 20.00% 50V                                     | CN412              | CONNECTOR, FFC/FPC 5P                       |              |                                        |
| C627     | 1-164-232-11 | CERAMIC CHIP | 0.01UF 10.00% 50V                                   |                    |                                             |              |                                        |
| C629     | 1-135-372-31 | ELECT        | 470UF 20% 10V                                       |                    |                                             |              |                                        |
| C630     | 1-164-232-11 | CERAMIC CHIP | 0.01UF 10.00% 50V                                   |                    |                                             |              |                                        |
| C631     | 1-164-232-11 | CERAMIC CHIP | 0.01UF 10.00% 50V                                   |                    |                                             |              |                                        |
| C633     | 1-164-232-11 | CERAMIC CHIP | 0.01UF 10.00% 50V                                   |                    |                                             |              |                                        |

**Note :**

The components identified by mark △ or dotted line with mark △ are critical for safety.  
Replace only with part number specified.

# MA-402

| Ref. No. | Part No.     | Description                  | Remarks                          | Ref. No. | Part No.     | Description        | Remarks           |
|----------|--------------|------------------------------|----------------------------------|----------|--------------|--------------------|-------------------|
| CN412    | 1-784-484-11 | CONNECTOR, FFC/FPC 5P        |                                  | IC031    | 8-759-645-07 | IC LB1943N         |                   |
| △CN600   | 1-580-230-11 | PIN, CONNECTOR (PC BOARD) 2P |                                  | IC101    | 8-759-831-29 | IC HD6432197A32FY  |                   |
|          |              | <JACK>                       |                                  | IC141    | 8-759-580-62 | IC MM1256AFBE      |                   |
| CNJ9011  | 1-793-001-21 | JACK, PIN (6P)               | (SLV-EX80S/EX90S)                | IC142    | 8-759-575-72 | IC M24C08-WMN6T(A) |                   |
| CNJ9031  | 1-779-010-11 | JACK, PIN 4P                 | (SLV-EX50)                       | IC201    | 8-759-589-33 | IC HA118217LF      |                   |
|          |              | <DIODE>                      |                                  | IC291    | 8-759-566-07 | IC LA7277M-TLM     | (SLV-EX90S)       |
| D001     | 8-719-048-26 | DIODE GL528V1                |                                  | IC301    | 8-759-638-56 | IC TDA9605H/N2,557 | (SLV-EX80S/EX90S) |
| D071     | 8-719-200-82 | DIODE MPG06D-6052PKG3        |                                  | IC451    | 8-759-643-83 | IC UPD16315GB-3BS  |                   |
| D100     | 8-719-911-19 | DIODE 1SS119-25TD            |                                  | IC502    | 8-749-015-48 | IC RPM6940         |                   |
| D101     | 8-719-200-82 | DIODE MPG06D-6052PKG3        |                                  | △IC600   | 8-749-018-38 | IC MA8910          |                   |
| D102     | 8-719-200-82 | DIODE MPG06D-6052PKG3        |                                  |          |              |                    |                   |
| D103     | 8-719-200-82 | DIODE MPG06D-6052PKG3        |                                  | △IC601   | 8-759-420-19 | IC AN1431T-TA      |                   |
| D151     | 8-719-911-19 | DIODE 1SS119-25TD            |                                  | IC660    | 8-759-438-18 | IC PQ12RD08        |                   |
| D201     | 8-719-911-19 | DIODE 1SS119-25TD            | (SLV-EX50BR/<br>EX80SBR/EX90SBR) | IC662    | 8-759-471-81 | IC PQ05RD11        |                   |
| D401     | 8-719-059-98 | DIODE SLR-342VCT31           | (SLV-EX90S)                      | IC701    | 8-742-037-00 | HYB IC SBX1837-51  | (SLV-EX80S/EX90S) |
| D402     | 8-719-056-06 | DIODE SLR-342DCT31           | (SLV-EX90S)                      |          |              |                    |                   |
| D403     | 8-719-200-82 | DIODE MPG06D-6052PKG3        |                                  |          |              |                    |                   |
| D404     | 8-719-109-89 | DIODE RD5.6ES-T1B2           |                                  |          |              |                    |                   |
| △D600    | 8-719-051-93 | DIODE DF06M-6031             |                                  |          |              |                    |                   |
| D601     | 8-719-063-70 | DIODE D1NL20U-TA2            |                                  |          |              |                    |                   |
| D607     | 8-719-109-89 | DIODE RD5.6ES-T1B2           |                                  |          |              |                    |                   |
| D608     | 8-719-022-97 | DIODE D2S4MF                 |                                  |          |              |                    |                   |
| D609     | 8-719-083-43 | DIODE 31DQ06-FA7             |                                  |          |              |                    |                   |
| D611     | 8-719-313-17 | DIODE AU02A-V0               |                                  |          |              |                    |                   |
| D612     | 8-719-313-17 | DIODE AU02A-V0               |                                  |          |              |                    |                   |
| D613     | 8-719-043-76 | DIODE AK04V0                 |                                  |          |              |                    |                   |
| D614     | 8-719-160-64 | DIODE RD16F-T8B1             |                                  |          |              |                    |                   |
| D623     | 8-719-109-93 | DIODE RD6.2ES-T1B2           |                                  |          |              |                    |                   |
| D624     | 8-719-063-70 | DIODE D1NL20U-TA2            |                                  |          |              |                    |                   |
| D625     | 8-719-110-49 | DIODE MTZJ-T-77-18B          |                                  |          |              |                    |                   |
| D701     | 8-719-150-92 | DIODE RD33ES-T1B3            |                                  |          |              |                    |                   |
| D901     | 8-719-109-93 | DIODE RD6.2ES-T1B2           |                                  |          |              |                    |                   |
| D902     | 8-719-109-93 | DIODE RD6.2ES-T1B2           |                                  |          |              |                    |                   |
|          |              | <GROUND TERMINAL BOARD>      |                                  |          |              |                    |                   |
| ET600    | 1-537-771-21 | TERMINAL BOARD, GROUND       |                                  |          |              |                    |                   |
| ET601    | 1-537-771-21 | TERMINAL BOARD, GROUND       |                                  |          |              |                    |                   |
|          |              | <FUSE>                       |                                  |          |              |                    |                   |
| △F600    | 1-532-203-00 | FUSE                         |                                  |          |              |                    |                   |
|          |              | <FUSE HOLDER>                |                                  |          |              |                    |                   |
| FH600    | 1-533-217-31 | HOLDER, FUSE                 |                                  |          |              |                    |                   |
| FH601    | 1-533-217-31 | HOLDER, FUSE                 |                                  |          |              |                    |                   |
|          |              | <IC>                         |                                  |          |              |                    |                   |

## Note:

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| Ref. No. | Part No.     | Description       | Remarks                        | Ref. No. | Part No.     | Description                  | Remarks                |
|----------|--------------|-------------------|--------------------------------|----------|--------------|------------------------------|------------------------|
| JR044    | 1-216-295-00 | SHORT             | 0                              |          |              | <COIL>                       |                        |
| JR045    | 1-216-295-00 | SHORT             | 0                              |          |              |                              |                        |
| JR046    | 1-216-295-00 | SHORT             | 0                              | L072     | 1-414-179-51 | INDUCTOR                     | 2.2UH                  |
|          |              |                   |                                | L151     | 1-414-185-51 | INDUCTOR                     | 22UH                   |
| JR047    | 1-216-295-00 | SHORT             | 0                              | L171     | 1-414-185-51 | INDUCTOR                     | 22UH                   |
| JR101    | 1-216-296-00 | SHORT             | 0                              | L172     | 1-414-185-51 | INDUCTOR                     | 22UH                   |
| JR102    | 1-216-296-00 | SHORT             | 0                              | L173     | 1-410-511-11 | INDUCTOR                     | 15UH                   |
| JR103    | 1-216-296-00 | SHORT             | 0                              |          |              |                              |                        |
| JR104    | 1-216-296-00 | SHORT             | 0                              | L202     | 1-414-856-51 | INDUCTOR                     | 10UH                   |
|          |              |                   |                                | L203     | 1-414-857-51 | INDUCTOR                     | 100UH                  |
| JR105    | 1-216-296-00 | SHORT             | 0                              | L204     | 1-410-510-11 | INDUCTOR                     | 12UH                   |
| JR106    | 1-216-296-00 | SHORT             | 0                              | L205     | 1-414-856-51 | INDUCTOR                     | 10UH                   |
| JR107    | 1-216-296-00 | SHORT             | 0                              | L206     | 1-414-856-51 | INDUCTOR                     | 10UH                   |
| JR108    | 1-216-296-00 | SHORT             | 0                              |          |              |                              |                        |
| JR109    | 1-216-296-00 | SHORT             | 0                              | L207     | 1-414-856-51 | INDUCTOR                     | 10UH                   |
|          |              |                   |                                | L211     | 1-414-193-51 | INDUCTOR                     | 220UH                  |
| JR110    | 1-216-296-00 | SHORT             | 0                              | L214     | 1-414-856-51 | INDUCTOR                     | 10UH                   |
| JR111    | 1-216-296-00 | SHORT             | 0                              | L215     | 1-414-187-51 | INDUCTOR                     | 47UH                   |
| JR112    | 1-216-296-00 | SHORT             | 0                              | L372     | 1-414-857-51 | INDUCTOR                     | 100UH                  |
| JR113    | 1-216-296-00 | SHORT             | 0                              |          |              |                              |                        |
| JR114    | 1-216-296-00 | SHORT             | 0                              | L601     | 1-403-588-11 | INDUCTOR                     | 22UH                   |
|          |              |                   |                                | L602     | 1-403-588-11 | INDUCTOR                     | 22UH                   |
| JR115    | 1-216-296-00 | SHORT             | 0                              | L603     | 1-414-142-11 | INDUCTOR                     | 1UH                    |
| JR116    | 1-216-296-00 | SHORT             | 0                              | L604     | 1-414-142-11 | INDUCTOR                     | 1UH                    |
| JR117    | 1-216-296-00 | SHORT             | 0                              | L606     | 1-414-142-11 | INDUCTOR                     | 1UH                    |
| JR118    | 1-216-296-00 | SHORT             | 0                              |          |              |                              |                        |
| JR119    | 1-216-296-00 | SHORT             | 0                              | L660     | 1-410-519-11 | INDUCTOR                     | 68UH                   |
|          |              |                   |                                | L700     | 1-414-856-51 | INDUCTOR                     | 10UH                   |
| JR120    | 1-216-296-00 | SHORT             | 0                              | L702     | 1-414-856-51 | INDUCTOR                     | 10UH                   |
| JR121    | 1-216-296-00 | SHORT             | 0                              | L705     | 1-414-856-51 | INDUCTOR                     | 10UH (SLV-EX80S/EX90S) |
| JR122    | 1-216-296-00 | SHORT             | 0                              |          |              |                              |                        |
| JR123    | 1-216-296-00 | SHORT             | 0                              |          |              |                              |                        |
| JR124    | 1-216-296-00 | SHORT             | 0                              | L901     | 1-414-857-51 | INDUCTOR                     | 100UH                  |
|          |              |                   |                                |          |              |                              |                        |
| JR125    | 1-216-296-00 | SHORT             | 0                              |          |              | <FILTER>                     |                        |
| JR126    | 1-216-296-00 | SHORT             | 0                              |          |              |                              |                        |
| JR127    | 1-216-296-00 | SHORT             | 0                              | LF600    | 1-416-929-11 | FILTER, LINE                 |                        |
| JR128    | 1-216-296-00 | SHORT             | 0                              |          |              |                              |                        |
| JR129    | 1-216-296-00 | SHORT             | 0                              |          |              |                              |                        |
|          |              |                   |                                |          |              |                              |                        |
| JR130    | 1-216-296-00 | SHORT             | 0                              |          |              | <FLUORESCENT INDICATOR TUBE> |                        |
| JR131    | 1-216-296-00 | SHORT             | 0                              |          |              |                              |                        |
| JR132    | 1-216-296-00 | SHORT             | 0                              | ND451    | 1-517-734-11 | TUBE, FLUORESCENT INDICATOR  |                        |
|          |              |                   |                                |          |              |                              |                        |
|          |              | <JUMPER SELECTOR> |                                |          |              | <PHOTO COUPLER>              |                        |
| JS151    | 1-216-295-00 | SHORT             | 0                              | PH001    | 8-749-013-23 | PHOTO INTERRUPTER GP3S120    |                        |
| JS152    | 1-216-295-00 | SHORT             | 0                              | PH002    | 8-749-013-23 | PHOTO INTERRUPTER GP3S120    |                        |
| JS203    | 1-216-296-00 | SHORT             | 0                              | △PH600   | 8-749-010-64 | PHOTO COUPLER PC123FY2       |                        |
| JS204    | 1-216-296-00 | SHORT             | 0                              |          |              |                              |                        |
| JS208    | 1-216-295-00 | SHORT             | 0                              |          |              | <IC LINK>                    |                        |
|          |              |                   | (SLV-EX50/<br>EX80SAR/EX90SAR) |          |              |                              |                        |
| JS291    | 1-216-296-00 | SHORT             | 0                              | PS031    | 1-533-593-51 | LINK, IC                     |                        |
| JS309    | 1-216-295-00 | SHORT             | 0                              | △PS071   | 1-576-384-21 | LINK, IC                     |                        |
| JS360    | 1-216-295-00 | SHORT             | 0                              | △PS072   | 1-576-384-21 | LINK, IC                     |                        |
| JS379    | 1-216-295-00 | SHORT             | 0                              | △PS331   | 1-533-586-51 | LINK, IC                     |                        |
| JS664    | 1-216-295-00 | SHORT             | 0                              | △PS661   | 1-576-384-21 | LINK, IC                     |                        |
|          |              |                   |                                |          |              |                              |                        |
| JS712    | 1-216-295-00 | SHORT             | 0                              |          |              | <TRANSISTOR>                 |                        |
| JS726    | 1-216-295-00 | SHORT             | 0                              |          |              |                              |                        |
| JS735    | 1-216-295-00 | SHORT             | 0                              | Q001     | 8-729-043-84 | TRANSISTOR PT380F3           |                        |
| JS737    | 1-216-295-00 | SHORT             | 0                              | Q002     | 8-729-043-84 | TRANSISTOR PT380F3           |                        |
| JS738    | 1-216-295-00 | SHORT             | 0                              | Q003     | 8-729-281-53 | TRANSISTOR 2SC1815GR-TPE2    |                        |
|          |              |                   | (SLV-EX80S/EX90S)              | Q153     | 8-729-422-27 | TRANSISTOR 2SD601A-QRS-TX    |                        |
| JS901    | 1-216-295-00 | SHORT             | 0                              | Q171     | 8-729-421-22 | TRANSISTOR UN2211-TX         |                        |
| JS902    | 1-216-295-00 | SHORT             | 0                              |          |              |                              |                        |
| JS905    | 1-216-296-00 | SHORT             | 0                              |          |              |                              |                        |
| JS906    | 1-216-295-00 | SHORT             | 0                              |          |              |                              |                        |
| JS907    | 1-216-295-00 | SHORT             | 0                              |          |              |                              |                        |
|          |              |                   | (SLV-EX50)                     |          |              |                              |                        |
|          |              |                   | (SLV-EX50)                     |          |              |                              |                        |

**Note :**  
The components identified by  
mark △ or dotted line with mark  
△ are critical for safety.  
Replace only with part number  
specified.

# MA-402

| Ref. No. | Part No.     | Description                                          | Remarks |
|----------|--------------|------------------------------------------------------|---------|
| Q172     | 8-729-424-02 | TRANSISTOR 2SB709A-QRS-TX                            |         |
| Q174     | 8-729-421-22 | TRANSISTOR UN2211-TX                                 |         |
| Q201     | 8-729-424-02 | TRANSISTOR 2SB709A-QRS-TX                            |         |
| Q203     | 8-729-421-19 | TRANSISTOR UN2213-TX                                 |         |
| Q204     | 8-729-421-19 | TRANSISTOR UN2213-TX<br>(SLV-EX50AR/EX80SAR/EX90SAR) |         |
| Q205     | 8-729-421-19 | TRANSISTOR UN2213-TX<br>(SLV-EX50BR/EX80SBR/EX90SBR) |         |
| Q206     | 8-729-421-19 | TRANSISTOR UN2213-TX                                 |         |
| Q210     | 8-729-421-19 | TRANSISTOR UN2213-TX                                 |         |
| Q211     | 8-729-422-27 | TRANSISTOR 2SD601A-QRS-TX                            |         |
| Q301     | 8-729-216-21 | TRANSISTOR 2SA1162Y-TE85L<br>(SLV-EX80S/EX90S)       |         |
| Q302     | 8-729-200-13 | TRANSISTOR 2SC2712Y-TE85L<br>(SLV-EX80S/EX90S)       |         |
| Q303     | 8-729-200-13 | TRANSISTOR 2SC2712Y-TE85L<br>(SLV-EX80S/EX90S)       |         |
| Q372     | 8-729-422-27 | TRANSISTOR 2SD601A-QRS-TX                            |         |
| Q373     | 8-729-422-27 | TRANSISTOR 2SD601A-QRS-TX                            |         |
| Q374     | 8-729-424-18 | TRANSISTOR UN2113-TX                                 |         |
| Q375     | 8-729-012-31 | TRANSISTOR 2SC4040-TL2-Q                             |         |
| Q376     | 8-729-900-51 | TRANSISTOR UN2115-QRS(TX)                            |         |
| Q377     | 8-729-421-19 | TRANSISTOR UN2213-TX                                 |         |
| Q704     | 8-729-421-19 | TRANSISTOR UN2213-TX<br>(SLV-EX80S/EX90S)            |         |
| Q706     | 8-729-421-19 | TRANSISTOR UN2213-TX                                 |         |
| Q707     | 8-729-119-76 | TRANSISTOR 2SA1309A-QRSTA                            |         |
| Q901     | 8-729-424-02 | TRANSISTOR 2SB709A-QRS-TX                            |         |
|          |              | <RESISTOR>                                           |         |
| R001     | 1-249-413-11 | CARBON 470 5% 1/4W                                   |         |
| R003     | 1-249-421-11 | CARBON 2.2K 5% 1/4W                                  |         |
| R004     | 1-216-057-00 | RES-CHIP 2.2K 5% 1/10W                               |         |
| R005     | 1-249-401-11 | CARBON 47 5% 1/4W                                    |         |
| R006     | 1-249-401-11 | CARBON 47 5% 1/4W                                    |         |
| R007     | 1-249-437-11 | CARBON 47K 5% 1/4W                                   |         |
| R008     | 1-249-437-11 | CARBON 47K 5% 1/4W                                   |         |
| R009     | 1-249-433-11 | CARBON 22K 5% 1/4W                                   |         |
| R010     | 1-249-433-11 | CARBON 22K 5% 1/4W                                   |         |
| R032     | 1-216-089-00 | RES-CHIP 47K 5% 1/10W                                |         |
| R034     | 1-216-689-11 | RES-CHIP 39K 5% 1/10W                                |         |
| R035     | 1-216-689-11 | RES-CHIP 39K 5% 1/10W                                |         |
| R051     | 1-249-425-11 | CARBON 4.7K 5% 1/4W                                  |         |
| R052     | 1-216-065-00 | RES-CHIP 4.7K 5% 1/10W                               |         |
| R053     | 1-247-843-11 | CARBON 3.3K 5% 1/4W                                  |         |
| R056     | 1-249-425-11 | CARBON 4.7K 5% 1/4W                                  |         |
| R057     | 1-216-073-00 | RES-CHIP 10K 5% 1/10W                                |         |
| R071     | 1-216-103-00 | RES-CHIP 180K 5% 1/10W                               |         |
| R072     | 1-216-089-00 | RES-CHIP 47K 5% 1/10W                                |         |
| R073     | 1-216-049-00 | RES-CHIP 1K 5% 1/10W                                 |         |
| R074     | 1-216-049-00 | RES-CHIP 1K 5% 1/10W                                 |         |
| R075     | 1-216-049-00 | RES-CHIP 1K 5% 1/10W                                 |         |
| R076     | 1-249-417-11 | CARBON 1K 5% 1/4W                                    |         |
| R100     | 1-216-085-91 | RES-CHIP 33K 5% 1/10W                                |         |
| R101     | 1-216-073-00 | RES-CHIP 10K 5% 1/10W<br>(SLV-EX50/EX80SBR)          |         |
| R101     | 1-216-081-00 | RES-CHIP 22K 5% 1/10W<br>(SLV-EX90SAR)               |         |
| R101     | 1-216-077-91 | RES-CHIP 15K 5% 1/10W<br>(SLV-EX80SAR)               |         |

| Ref. No. | Part No.     | Description                                         | Remarks |
|----------|--------------|-----------------------------------------------------|---------|
| R102     | 1-216-073-00 | RES-CHIP 10K 5% 1/10W<br>(SLV-EX50AR/EX80SAR/EX90S) |         |
| R102     | 1-216-059-00 | RES-CHIP 2.7K 5% 1/10W<br>(SLV-EX50BR)              |         |
| R102     | 1-216-049-00 | RES-CHIP 1K 5% 1/10W<br>(SLV-EX80SBR)               |         |
| R103     | 1-216-073-00 | RES-CHIP 10K 5% 1/10W                               |         |
| R104     | 1-247-807-31 | CARBON 100 5% 1/4W                                  |         |
| R105     | 1-249-429-11 | CARBON 10K 5% 1/4W                                  |         |
| R107     | 1-216-049-00 | RES-CHIP 1K 5% 1/10W                                |         |
| R108     | 1-216-073-00 | RES-CHIP 10K 5% 1/10W                               |         |
| R109     | 1-216-049-00 | RES-CHIP 1K 5% 1/10W                                |         |
| R110     | 1-249-429-11 | CARBON 10K 5% 1/4W                                  |         |
| R111     | 1-216-081-00 | RES-CHIP 22K 5% 1/10W                               |         |
| R112     | 1-216-041-00 | RES-CHIP 470 5% 1/10W                               |         |
| R113     | 1-216-041-00 | RES-CHIP 470 5% 1/10W                               |         |
| R114     | 1-216-041-00 | RES-CHIP 470 5% 1/10W                               |         |
| R115     | 1-216-041-00 | RES-CHIP 470 5% 1/10W                               |         |
| R116     | 1-216-089-00 | RES-CHIP 47K 5% 1/10W                               |         |
| R117     | 1-249-417-11 | CARBON 1K 5% 1/4W                                   |         |
| R118     | 1-216-089-00 | RES-CHIP 47K 5% 1/10W                               |         |
| R119     | 1-216-089-00 | RES-CHIP 47K 5% 1/10W                               |         |
| R120     | 1-216-089-00 | RES-CHIP 47K 5% 1/10W                               |         |
| R121     | 1-216-049-00 | RES-CHIP 1K 5% 1/10W                                |         |
| R122     | 1-216-121-11 | RES-CHIP 1M 5% 1/10W                                |         |
| R123     | 1-249-429-11 | CARBON 10K 5% 1/4W                                  |         |
| R124     | 1-249-429-11 | CARBON 10K 5% 1/4W                                  |         |
| R125     | 1-249-437-11 | CARBON 47K 5% 1/4W                                  |         |
| R126     | 1-216-049-00 | RES-CHIP 1K 5% 1/10W                                |         |
| R127     | 1-216-073-00 | RES-CHIP 10K 5% 1/10W                               |         |
| R128     | 1-216-073-00 | RES-CHIP 10K 5% 1/10W                               |         |
| R129     | 1-249-441-11 | CARBON 100K 5% 1/4W                                 |         |
| R130     | 1-216-049-00 | RES-CHIP 1K 5% 1/10W                                |         |
| R131     | 1-249-429-11 | CARBON 10K 5% 1/4W                                  |         |
| R132     | 1-249-429-11 | CARBON 10K 5% 1/4W                                  |         |
| R133     | 1-216-121-11 | RES-CHIP 1M 5% 1/10W                                |         |
| R142     | 1-247-887-00 | CARBON 220K 5% 1/4W                                 |         |
| R143     | 1-216-113-00 | RES-CHIP 470K 5% 1/10W                              |         |
| R144     | 1-216-105-91 | RES-CHIP 220K 5% 1/10W                              |         |
| R151     | 1-216-113-00 | RES-CHIP 470K 5% 1/10W                              |         |
| R152     | 1-216-025-11 | RES-CHIP 100 5% 1/10W                               |         |
| R153     | 1-216-073-00 | RES-CHIP 10K 5% 1/10W                               |         |
| R154     | 1-216-097-11 | RES-CHIP 100K 5% 1/10W                              |         |
| R155     | 1-216-121-11 | RES-CHIP 1M 5% 1/10W                                |         |
| R156     | 1-249-435-11 | CARBON 33K 5% 1/4W                                  |         |
| R157     | 1-216-073-00 | RES-CHIP 10K 5% 1/10W                               |         |
| R158     | 1-216-073-00 | RES-CHIP 10K 5% 1/10W                               |         |
| R159     | 1-216-049-00 | RES-CHIP 1K 5% 1/10W                                |         |
| R160     | 1-216-041-00 | RES-CHIP 470 5% 1/10W                               |         |
| R161     | 1-216-065-00 | RES-CHIP 4.7K 5% 1/10W                              |         |
| R162     | 1-216-073-00 | RES-CHIP 10K 5% 1/10W                               |         |
| R163     | 1-216-049-00 | RES-CHIP 1K 5% 1/10W                                |         |
| R164     | 1-216-049-00 | RES-CHIP 1K 5% 1/10W                                |         |
| R165     | 1-249-429-11 | CARBON 10K 5% 1/4W                                  |         |
| R166     | 1-216-295-00 | SHORT 0                                             |         |
| R167     | 1-216-295-00 | SHORT 0                                             |         |
| R171     | 1-216-049-00 | RES-CHIP 1K 5% 1/10W                                |         |
| R172     | 1-247-807-31 | CARBON 100 5% 1/4W                                  |         |
| R174     | 1-216-045-00 | RES-CHIP 680 5% 1/10W                               |         |
| R175     | 1-216-041-00 | RES-CHIP 470 5% 1/10W                               |         |
| R177     | 1-216-065-00 | RES-CHIP 4.7K 5% 1/10W                              |         |

| Ref. No. | Part No.     | Description    | Remarks                                  | Ref. No. | Part No.     | Description    | Remarks                         |
|----------|--------------|----------------|------------------------------------------|----------|--------------|----------------|---------------------------------|
| R192     | 1-216-073-00 | RES-CHIP 10K   | 5% 1/10W                                 | R304     | 1-216-049-00 | RES-CHIP 1K    | 5% 1/10W<br>(SLV-EX80S/EX90S)   |
| R193     | 1-216-073-00 | RES-CHIP 10K   | 5% 1/10W                                 | R305     | 1-216-049-00 | RES-CHIP 1K    | 5% 1/10W<br>(SLV-EX80S/EX90S)   |
| R194     | 1-216-073-00 | RES-CHIP 10K   | 5% 1/10W                                 | R306     | 1-216-083-00 | RES-CHIP 27K   | 5% 1/10W<br>(SLV-EX80S/EX90S)   |
| R201     | 1-216-049-00 | RES-CHIP 1K    | 5% 1/10W                                 | R307     | 1-216-057-00 | RES-CHIP 2.2K  | 5% 1/10W<br>(SLV-EX80S/EX90S)   |
| R202     | 1-216-041-00 | RES-CHIP 470   | 5% 1/10W                                 | R308     | 1-208-820-11 | METAL CHIP 39K | 0.5% 1/10W<br>(SLV-EX80S/EX90S) |
| R203     | 1-247-807-31 | CARBON 100     | 5% 1/4W<br>(SLV-EX50BR/EX80SBR/EX90SBR)  | R309     | 1-216-041-00 | RES-CHIP 470   | 5% 1/10W<br>(SLV-EX80S/EX90S)   |
| R204     | 1-216-083-00 | RES-CHIP 27K   | 5% 1/10W                                 | R310     | 1-216-041-00 | RES-CHIP 470   | 5% 1/10W<br>(SLV-EX80S/EX90S)   |
| R205     | 1-216-069-00 | RES-CHIP 6.8K  | 5% 1/10W                                 | R311     | 1-216-057-00 | RES-CHIP 2.2K  | 5% 1/10W<br>(SLV-EX80S/EX90S)   |
| R206     | 1-216-053-00 | RES-CHIP 1.5K  | 5% 1/10W                                 | R312     | 1-216-083-00 | RES-CHIP 27K   | 5% 1/10W<br>(SLV-EX80S/EX90S)   |
| R207     | 1-216-065-00 | RES-CHIP 4.7K  | 5% 1/10W                                 | R313     | 1-216-133-91 | RES-CHIP 3.3M  | 5% 1/10W<br>(SLV-EX80S/EX90S)   |
| R208     | 1-216-069-00 | RES-CHIP 6.8K  | 5% 1/10W<br>(SLV-EX50AR/EX80SAR/EX90SBR) | R314     | 1-216-073-00 | RES-CHIP 10K   | 5% 1/10W<br>(SLV-EX80S/EX90S)   |
| R208     | 1-216-073-00 | RES-CHIP 10K   | 5% 1/10W<br>(SLV-EX50BR/EX80SBR/EX90SAR) | R317     | 1-216-061-91 | RES-CHIP 3.3K  | 5% 1/10W<br>(SLV-EX80S/EX90S)   |
| R209     | 1-216-069-00 | RES-CHIP 6.8K  | 5% 1/10W<br>(SLV-EX50AR/EX80SAR)         | R318     | 1-216-049-00 | RES-CHIP 1K    | 5% 1/10W<br>(SLV-EX80S/EX90S)   |
| R209     | 1-216-049-00 | RES-CHIP 1K    | 5% 1/10W<br>(SLV-EX90SAR)                | R319     | 1-216-049-00 | RES-CHIP 1K    | 5% 1/10W<br>(SLV-EX80S/EX90S)   |
| R211     | 1-216-295-00 | SHORT 0        | (SLV-EX90S)                              | R322     | 1-216-295-00 | SHORT 0        | (SLV-EX80S/EX90S)               |
| R212     | 1-216-063-91 | RES-CHIP 3.9K  | 5% 1/10W<br>(SLV-EX50/EX80SAR)           | R327     | 1-216-041-00 | RES-CHIP 470   | 5% 1/10W<br>(SLV-EX80S/EX90S)   |
| R212     | 1-216-051-00 | RES-CHIP 1.2K  | 5% 1/10W<br>(SLV-EX80SBR)                | R328     | 1-216-041-00 | RES-CHIP 470   | 5% 1/10W<br>(SLV-EX80S/EX90S)   |
| R214     | 1-216-025-11 | RES-CHIP 100   | 5% 1/10W<br>(SLV-EX80S/EX90S)            | R329     | 1-216-041-00 | RES-CHIP 470   | 5% 1/10W<br>(SLV-EX80S/EX90S)   |
| R215     | 1-216-025-11 | RES-CHIP 100   | 5% 1/10W                                 | R350     | 1-216-073-00 | RES-CHIP 10K   | 5% 1/10W                        |
| R216     | 1-247-807-31 | CARBON 100     | 5% 1/4W                                  | R351     | 1-216-061-91 | RES-CHIP 3.3K  | 5% 1/10W                        |
| R218     | 1-216-065-00 | RES-CHIP 4.7K  | 5% 1/10W                                 | R352     | 1-216-101-00 | RES-CHIP 150K  | 5% 1/10W                        |
| R219     | 1-259-880-11 | CARBON 2.2M    | 5% 1/4W                                  | R353     | 1-216-025-11 | RES-CHIP 100   | 5% 1/10W                        |
| R222     | 1-216-033-00 | RES-CHIP 220   | 5% 1/10W<br>(SLV-EX50AR/EX80SAR/EX90SAR) | R354     | 1-216-085-91 | RES-CHIP 33K   | 5% 1/10W                        |
| R222     | 1-216-041-00 | RES-CHIP 470   | 5% 1/10W<br>(SLV-EX50BR/EX80SBR/EX90SBR) | R355     | 1-216-079-00 | RES-CHIP 18K   | 5% 1/10W                        |
| R223     | 1-216-033-00 | RES-CHIP 220   | 5% 1/10W<br>(SLV-EX50AR/EX80SAR/EX90SAR) | R356     | 1-216-083-00 | RES-CHIP 27K   | 5% 1/10W                        |
| R223     | 1-216-041-00 | RES-CHIP 470   | 5% 1/10W<br>(SLV-EX50BR/EX80SBR/EX90SBR) | R357     | 1-216-295-00 | SHORT 0        |                                 |
| R224     | 1-216-049-00 | RES-CHIP 1K    | 5% 1/10W                                 | R360     | 1-216-077-91 | RES-CHIP 15K   | 5% 1/10W                        |
| R225     | 1-249-417-11 | CARBON 1K      | 5% 1/4W                                  | R361     | 1-249-437-11 | CARBON 47K     | 5% 1/4W                         |
| R226     | 1-216-099-00 | RES-CHIP 120K  | 5% 1/10W                                 | R362     | 1-216-077-91 | RES-CHIP 15K   | 5% 1/10W<br>(SLV-EX50)          |
| R228     | 1-216-041-00 | RES-CHIP 470   | 5% 1/10W<br>(SLV-EX50AR/EX80S/EX90S)     | R363     | 1-249-437-11 | CARBON 47K     | 5% 1/4W<br>(SLV-EX50)           |
| R228     | 1-216-043-91 | RES-CHIP 560   | 5% 1/10W<br>(SLV-EX50BR)                 | R364     | 1-216-295-00 | SHORT 0        |                                 |
| R289     | 1-216-049-00 | RES-CHIP 1K    | 5% 1/10W<br>(SLV-EX90S)                  | R365     | 1-216-065-00 | RES-CHIP 4.7K  | 5% 1/10W                        |
| R291     | 1-208-806-11 | METAL CHIP 10K | 0.5% 1/10W<br>(SLV-EX90S)                | R366     | 1-216-041-00 | RES-CHIP 470   | 5% 1/10W                        |
| R292     | 1-216-127-11 | RES-CHIP 1.8M  | 5% 1/10W<br>(SLV-EX50BR/EX80SBR/EX90SBR) | R368     | 1-216-125-00 | RES-CHIP 1.5M  | 5% 1/10W                        |
| R294     | 1-247-807-31 | CARBON 100     | 5% 1/4W<br>(SLV-EX90S)                   | R370     | 1-216-089-00 | RES-CHIP 47K   | 5% 1/10W                        |
| R295     | 1-247-807-31 | CARBON 100     | 5% 1/4W<br>(SLV-EX90S)                   | R371     | 1-249-411-11 | CARBON 330     | 5% 1/4W                         |
| R296     | 1-249-428-11 | CARBON 8.2K    | 5% 1/4W<br>(SLV-EX90S)                   | R372     | 1-249-411-11 | CARBON 330     | 5% 1/4W                         |
| R299     | 1-216-071-00 | RES-CHIP 8.2K  | 5% 1/10W<br>(SLV-EX90S)                  | R375     | 1-216-073-00 | RES-CHIP 10K   | 5% 1/10W                        |
| R301     | 1-216-073-00 | RES-CHIP 10K   | 5% 1/10W<br>(SLV-EX80S/EX90S)            | R376     | 1-216-073-00 | RES-CHIP 10K   | 5% 1/10W                        |
| R302     | 1-216-079-00 | RES-CHIP 18K   | 5% 1/10W<br>(SLV-EX80S/EX90S)            | R378     | 1-216-073-00 | RES-CHIP 10K   | 5% 1/10W                        |
|          |              |                |                                          | R379     | 1-249-433-11 | CARBON 22K     | 5% 1/4W                         |
|          |              |                |                                          | R380     | 1-216-308-00 | RES-CHIP 4.7   | 5% 1/10W                        |
|          |              |                |                                          | R386     | 1-216-057-00 | RES-CHIP 2.2K  | 5% 1/10W                        |

# MA-402

| Ref. No. | Part No.     | Description     | Remarks                |
|----------|--------------|-----------------|------------------------|
| R387     | 1-216-057-00 | RES-CHIP 2.2K   | 5% 1/10W<br>(SLV-EX50) |
| R400     | 1-216-021-00 | RES-CHIP 68     | 5% 1/10W               |
| R401     | 1-249-410-11 | CARBON 270      | 5% 1/4W<br>(SLV-EX90S) |
| R402     | 1-249-408-11 | CARBON 180      | 5% 1/4W<br>(SLV-EX90S) |
| R404     | 1-249-437-11 | CARBON 47K      | 5% 1/4W                |
| R405     | 1-249-437-11 | CARBON 47K      | 5% 1/4W                |
| R410     | 1-249-403-11 | CARBON 68       | 5% 1/4W                |
| R411     | 1-249-419-11 | CARBON 1.5K     | 5% 1/4W                |
| R414     | 1-216-061-91 | RES-CHIP 3.3K   | 5% 1/10W               |
| R415     | 1-216-065-00 | RES-CHIP 4.7K   | 5% 1/10W               |
| R416     | 1-249-427-11 | CARBON 6.8K     | 5% 1/4W                |
| R417     | 1-249-431-11 | CARBON 15K      | 5% 1/4W                |
| R418     | 1-216-089-00 | RES-CHIP 47K    | 5% 1/10W               |
| R424     | 1-216-061-91 | RES-CHIP 3.3K   | 5% 1/10W               |
| R425     | 1-216-065-00 | RES-CHIP 4.7K   | 5% 1/10W               |
| R426     | 1-216-069-00 | RES-CHIP 6.8K   | 5% 1/10W               |
| R427     | 1-216-077-91 | RES-CHIP 15K    | 5% 1/10W               |
| R428     | 1-216-089-00 | RES-CHIP 47K    | 5% 1/10W               |
| R451     | 1-249-413-11 | CARBON 470      | 5% 1/4W                |
| R452     | 1-216-049-00 | RES-CHIP 1K     | 5% 1/10W               |
| R453     | 1-216-049-00 | RES-CHIP 1K     | 5% 1/10W               |
| R454     | 1-216-049-00 | RES-CHIP 1K     | 5% 1/10W               |
| R455     | 1-249-417-11 | CARBON 1K       | 5% 1/4W                |
| R457     | 1-216-065-00 | RES-CHIP 4.7K   | 5% 1/10W               |
| R458     | 1-216-065-00 | RES-CHIP 4.7K   | 5% 1/10W               |
| R459     | 1-216-085-91 | RES-CHIP 33K    | 5% 1/10W               |
| R526     | 1-249-437-11 | CARBON 47K      | 5% 1/4W                |
| R601     | 1-214-949-21 | METAL 3.3M      | 1% 1/2W                |
| R602     | 1-247-883-00 | CARBON 150K     | 5% 1/4W                |
| R603     | 1-247-891-00 | CARBON 330K     | 5% 1/4W                |
| R604     | 1-249-430-11 | CARBON 12K      | 5% 1/4W                |
| R605     | 1-249-419-11 | CARBON 1.5K     | 5% 1/4W                |
| R606     | 1-215-444-00 | METAL 9.1K      | 1% 1/4W                |
| R607     | 1-249-428-11 | CARBON 8.2K     | 5% 1/4W                |
| △ R611   | 1-260-364-11 | CARBON 1M       | 5% 1/2W                |
| R612     | 1-208-789-11 | METAL CHIP 2K   | 0.5% 1/10W             |
| R613     | 1-249-406-11 | CARBON 120      | 5% 1/4W                |
| R614     | 1-216-655-11 | METAL CHIP 1.5K | 0.5% 1/10W             |
| R615     | 1-216-057-00 | RES-CHIP 2.2K   | 5% 1/10W               |
| R616     | 1-249-401-11 | CARBON 47       | 5% 1/4W                |
| R617     | 1-249-417-11 | CARBON 1K       | 5% 1/4W                |
| R618     | 1-249-409-11 | CARBON 220      | 5% 1/4W                |
| △ R640   | 1-219-153-11 | FUSIBLE 10      | 5% 1/4W                |
| △ R641   | 1-219-153-11 | FUSIBLE 10      | 5% 1/4W                |
| R643     | 1-216-353-00 | METAL OXIDE 2.2 | 5% 1W                  |
| R647     | 1-215-465-00 | METAL 68K       | 1% 1/4W                |
| R648     | 1-216-057-00 | RES-CHIP 2.2K   | 5% 1/10W               |
| R649     | 1-249-401-11 | CARBON 47       | 5% 1/4W                |
| R651     | 1-215-459-00 | METAL 39K       | 1% 1/4W                |
| R668     | 1-216-073-00 | RES-CHIP 10K    | 5% 1/10W               |
| R705     | 1-216-295-00 | SHORT 0         |                        |
| R706     | 1-216-295-00 | SHORT 0         |                        |
| R707     | 1-216-295-00 | SHORT 0         |                        |
| R709     | 1-216-113-00 | RES-CHIP 470K   | 5% 1/10W               |

| Ref. No.            | Part No.     | Description                       | Remarks                       |
|---------------------|--------------|-----------------------------------|-------------------------------|
| R710                | 1-216-097-11 | RES-CHIP 100K                     | 5% 1/10W                      |
| R711                | 1-249-433-11 | CARBON 22K                        | 5% 1/4W                       |
| R717                | 1-216-049-00 | RES-CHIP 1K                       | 5% 1/10W                      |
| R718                | 1-249-417-11 | CARBON 1K                         | 5% 1/4W<br>(SLV-EX80S/EX90S)  |
| R719                | 1-249-417-11 | CARBON 1K                         | 5% 1/4W<br>(SLV-EX80S/EX90S)  |
| R720                | 1-249-433-11 | CARBON 22K                        | 5% 1/4W<br>(SLV-EX80S/EX90S)  |
| R721                | 1-249-433-11 | CARBON 22K                        | 5% 1/4W<br>(SLV-EX80S/EX90S)  |
| R726                | 1-216-295-00 | SHORT 0                           | (SLV-EX80S/EX90S)             |
| R727                | 1-216-295-00 | SHORT 0                           | (SLV-EX80S/EX90S)             |
| R728                | 1-216-295-00 | SHORT 0                           | (SLV-EX80S/EX90S)             |
| R729                | 1-249-429-11 | CARBON 10K                        | 5% 1/4W<br>(SLV-EX80S/EX90S)  |
| △ R730              | 1-240-307-81 | FUSIBLE 560                       | 5% 1/4W                       |
| R731                | 1-249-429-11 | CARBON 10K                        | 5% 1/4W<br>(SLV-EX80S/EX90S)  |
| R738                | 1-216-295-00 | SHORT 0                           |                               |
| R742                | 1-216-051-00 | RES-CHIP 1.2K                     | 5% 1/10W                      |
| R901                | 1-216-097-11 | RES-CHIP 100K                     | 5% 1/10W<br>(SLV-EX80S/EX90S) |
| R902                | 1-216-097-11 | RES-CHIP 100K                     | 5% 1/10W<br>(SLV-EX80S/EX90S) |
| R905                | 1-216-041-00 | RES-CHIP 470                      | 5% 1/10W<br>(SLV-EX80S/EX90S) |
| R906                | 1-216-041-00 | RES-CHIP 470                      | 5% 1/10W                      |
| R908                | 1-216-023-00 | RES-CHIP 82                       | 5% 1/10W                      |
| R909                | 1-249-407-11 | CARBON 150                        | 5% 1/4W                       |
| R910                | 1-216-025-11 | RES-CHIP 100                      | 5% 1/10W                      |
| R913                | 1-249-408-11 | CARBON 180                        | 5% 1/4W                       |
| R914                | 1-216-021-00 | RES-CHIP 68                       | 5% 1/10W                      |
| <VARIABLE RESISTOR> |              |                                   |                               |
| RV701               | 1-241-766-11 | RES, ADJ, CERMET 47K              | (SLV-EX80S/EX90S)             |
| <SWITCH>            |              |                                   |                               |
| S101                | 1-571-958-11 | SWITCH, PUSH (1 KEY) (REC PROOF)  |                               |
| S102                | 1-771-155-11 | SWITCH, ROTARY (CAM ENCODER)      |                               |
| S454                | 1-771-574-21 | SWITCH, TACTILE                   | (CHANNEL/TRACKING +)          |
| S458                | 1-771-574-21 | SWITCH, TACTILE (SYNCHRO REC)     | (SLV-EX90S)                   |
| S459                | 1-771-574-21 | SWITCH, TACTILE (COLOR SYSTEM)    |                               |
| S465                | 1-771-574-21 | SWITCH, TACTILE                   | (CHANNEL/TRACKING -)          |
| S466                | 1-771-574-21 | SWITCH, TACTILE (RF CHANNEL)      |                               |
| S467                | 1-771-574-21 | SWITCH, TACTILE (SP/LP)           |                               |
| S468                | 1-771-574-21 | SWITCH, TACTILE (R <sup>2</sup> ) | (SLV-EX90S)                   |
| S701                | 1-571-588-11 | SWITCH, SLIDE (RF UNIT)           |                               |
| <TRANSFORMER>       |              |                                   |                               |
| T371                | 1-423-414-11 | TRANSFORMER, BIAS OSCILLATION     |                               |
| △ T600              | 1-435-790-11 | TRANSFORMER, CONVERTER            |                               |

## Note:

The components identified by mark △ or dotted line with mark △ are critical for safety.  
Replace only with part number specified.

| <u>Ref. No.</u> | <u>Part No.</u> | <u>Description</u>      | <u>Remarks</u>                               |
|-----------------|-----------------|-------------------------|----------------------------------------------|
|                 |                 | <TUNER>                 |                                              |
| TU704           | 1-693-532-11    | TUNER (BTF-3MA413)      |                                              |
|                 |                 | <VARISTOR>              |                                              |
| VDR600          | 1-801-267-31    | VARISTOR TNR10V431K660  |                                              |
|                 |                 | <CRYSTAL>               |                                              |
| X101            | 1-767-855-11    | VIBRATOR, CRYSTAL       | 10mHz                                        |
| X102            | 1-579-463-11    | VIBRATOR, CRYSTAL       | 32.768kHz                                    |
| X151            | 1-795-327-11    | VIBRATOR, CRYSTAL       | 14.328224mHz<br>(SLV-EX50AR/EX80SAR/EX90SAR) |
| X151            | 1-781-517-11    | VIBRATOR, CRYSTAL       | 14.302444mHz<br>(SLV-EX50BR/EX80SBR/EX90SBR) |
| X201            | 1-781-577-11    | VIBRATOR, CRYSTAL       | 3582.056kHz<br>(SLV-EX50AR/EX80SAR/EX90SAR)  |
| X201            | 1-578-788-11    | VIBRATOR, CRYSTAL       | 3.575611mHz<br>(SLV-EX50BR/EX80SBR/EX90SBR)  |
| X202            | *1-760-709-11   | VIBRATOR, CRYSTAL       | 3579.545kHz                                  |
|                 |                 |                         |                                              |
|                 |                 | MISCELLANEOUS           |                                              |
|                 |                 | *****                   |                                              |
| 1-696-592-41    |                 | CORD, CONNECTION (NTSC) | (SLV-EX50/EX80SBR/EX90S)                     |
| 1-575-795-61    |                 | CORD, CONNECTION        | (SLV-EX80SBR/EX90SBR)                        |
| 1-791-157-31    |                 | CORD, POWER             | (SLV-EX50AR/EX80SAR/EX90SAR)                 |
| 1-757-665-11    |                 | CORD, POWER             | (SLV-EX50BR/EX80BR/EX90BR)                   |

| Ref. No.      | Part No.     | Description                  | Remarks                        |
|---------------|--------------|------------------------------|--------------------------------|
| ACCESSORIES   |              |                              |                                |
| *****         |              |                              |                                |
|               | 3-066-370-11 | MANUAL, INSTRUCTION          | (SLV-EX50AR/<br>EX80S/EX90AR)  |
|               | 3-066-371-11 | MANUAL, INSTRUCTION          | (SLV-EX50BR/<br>EX90BR)        |
|               | 1-476-475-71 | COMMANDER, STANDARD          | (RMT-V312)<br>(SLV-EX50/EX80S) |
|               | 1-476-475-81 | COMMANDER, STANDARD          | (RMT-V312A)<br>(SLV-EX90S)     |
|               |              |                              |                                |
| HARDWARE LIST |              |                              |                                |
| *****         |              |                              |                                |
|               | 3-710-901-61 | SCREW, TAPPING               |                                |
|               | 3-970-608-21 | SUMITITE (B3), +BV           |                                |
|               | 3-979-112-01 | SCREW SW(+)BVTP 3X10         |                                |
|               | 3-342-512-21 | SCREW (B1.7X3.5), TAPPING    |                                |
|               | 4-921-277-41 | SCREW (B2.8X8), TAPPING BIND |                                |
| #1            | 7-685-648-79 | SCREW +BVTP 3X12 TYPE 2 IT-3 |                                |
| #2            | 7-685-646-79 | SCREW +BVTP 3X8 TYPE 2 IT-3  |                                |
| #3            | 7-682-647-09 | SCREW +PS 3X6                |                                |
| #4            | 3-064-472-01 | SCREW +BVTP 2.6X6 (B TIGHT)  |                                |

